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STEEL

The Magazine of Metalworking and Metalproducing

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Improving Inventory Control Eliminates Production Delays

Corrosion-Resistant Alloys Resist Reactive Acids

Speeding up Production With Abrasive Belt Grinding

Easing Non-Routine Material Movements by Mobile Crane

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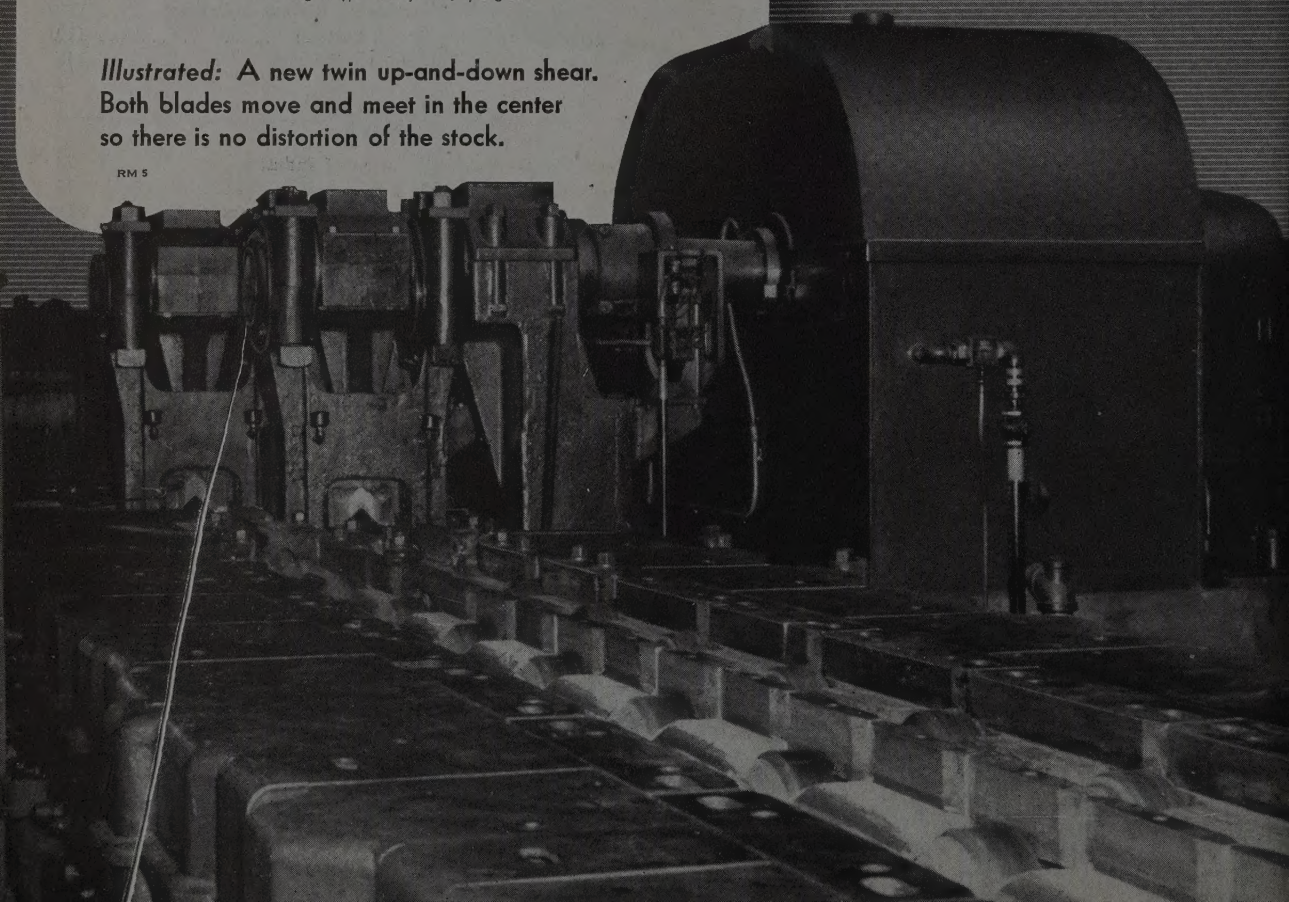
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Illustrated: A new twin up-and-down shear. Both blades move and meet in the center so there is no distortion of the stock.

RM 5



As the EDITOR VIEWS the NEWS

Safeguard Against War

One of the wastes of war that seldom attracts attention is the loss which results when combatant nations pursue uneconomic practices in the belief that they are justified by the exigencies of war. Japan, for instance, went to great lengths to develop processes for making sponge iron. She succeeded to a moderate extent and her development work in this field may contribute something worthwhile to future progress. However, the great majority of sponge iron projects initiated by the Japanese were outright failures. The same amount of money and effort directed toward expanding pig iron output undoubtedly would have been more profitable from a military standpoint.

Under the pressure of war and in the absence of adequate supplies of bauxite, Japan also spent money lavishly to produce aluminum from aluminous shale. Some aluminum was made in this manner but the cost was prohibitive and the plants uneconomic.

In Germany, great effort and much money were expended upon spectacular projects which not only contributed absolutely nothing to the war effort but actually diverted talent and materials from other more important activities. A case in point is the tremendous amount of armament and ordnance produced for battleships that never were built and for land operations that never ensued. In this connection, Hitler's fanatical zeal to have the biggest of everything often resulted in the construction of monstrosities of little military value.

Of course these practices of the enemy powers had their counterparts among the Allied Nations. In the United States we developed a number of military white elephants. The high pressure exploitation of uneconomic developments is widely accepted as a necessity of war. However, today when the world is striving hard to shift from a war to a peace basis the existence of thousands of these uneconomic undertakings throughout the world complicates the problems of readjustment to a serious extent. In fact, the painful consequences of these wartime follies suggest that there may be something of value in the old American free enterprise system of a generation or more ago when a new plant financed by private capital had to be an economic unit if it were to continue to exist against competition for a decade or more.

There has been a world-wide tendency to build plants with government money. Such plants do not need to be economic to survive. Therein lies a grave potential for war. Are not the automatic checks of the free enterprise system against uneconomic developments a safeguard against war?

STEEL
July 22, 1946

HELP NEEDED: Current box car and other equipment shortages are focusing attention on the difficult position of the railroads as they seek to accommodate available transport facilities to the traffic demands of the nation adjusting to peacetime.

Plight of western farmers compelled to dump precious wheat in the open because of the lack of cars to move it to storage provides a prime example of the acute car supply with which the nation is wrestling.

Virtually all of the railroads have projected ambitious rehabilitation programs to bring their properties to peak physical and operating efficiency. At the opening of this year railroad officials were highly optimistic of putting physical plant in shape with a minimum of delay.

Since then, however, much of this optimism has been dissipated by strikes in the steel and coal industries, in the copper and electrical industries, and in plants of locomotive and car builders which combined to curtail and delay production of needed replacement equipment. Then, also, the financial position of the carriers has deteriorated, placing in jeopardy at least part of their projected capital expenditures.

All of this adds up to trouble for the future. Ob-

(OVER)

viously, attainment of economic stability will be deferred indefinitely so long as the nation has to limp along with war-worn, patched-up transport facilities. Whatever aid is required by the railroads in putting their physical plant in tiptop shape must be forthcoming without delay, for further deterioration of equipment would be unthinkable and tragic.

—p. 51

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FOOD FOR THOUGHT: Fuzzy thinking of the leaders of certain influential segments of the union labor movement was demonstrated strikingly last week at many points throughout the nation. The spectacle of thousands of workmen quitting their jobs in mid-day on behest of their union leaders to participate in futile price control rallies provided the vehicle for showing what shallow thinkers are those who presume to think for labor.

The rallies were only partially successful, attendance falling below anticipated totals. And whether they will have any effect in influencing price control legislation is questionable.

Protests against rising prices will avail nothing if production is not forthcoming to bring supply and demand into balance quickly. Union leaders know this. Why, then, did they foment mass absenteeism, curbing production with resulting pay loss for the individual worker? Either the union leaders are dullards with limited think-power, or they seized upon the idea of mass absenteeism to demonstrate the influence which they think they can wield over the economy of the nation. Such foolish display of power, if such is the case, should occasion some solid thinking on the part of all of us. —p. 54

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"PULSE-BEATS" IN STEEL: Stress analysis has moved out of the laboratory where it has served to verify empirical formulae on small working models and into the field where components of a steel structure may be measured. An example is the recent study of welded H-section trusses by the Austin Co., Cleveland, and H. D. Churchill, professor of engineering mechanics, Case School of Applied Science.

The device which enables this out-of-doors testing is a portable, sensitive wire gage, the SR-4. The strain gages change their resistance with the strains resulting from varying applied loads. Only one-thousandth inch thick, these fine nickel-copper wires, when connected to electrical control equipment, measure to one millionth of an inch the average strain in a ½-inch length.

In the Austin-Churchill tests, completeness of data rapidly accumulated is indicated by the 3000 strain readings recorded at intervals during loading, unloading, and peak-load tests. —p. 99

SIGNS OF THE TIMES: Sharp curtailment in steelmaking operations over the next few weeks is threatened (p. 56) by growing scrap shortage. Some collectors are reported withholding material from the market pending clarification of the future of price control, thus accentuating the acute scarcity plaguing steel mills for months past. . . . Production in Canadian steel mills was only partially halted by a strike last week, thousands of workmen continuing on the job (p. 55). Strikers face fines for each day of absenteeism under government control. . . . Use of soft-grit blasting in removing carbon deposits from cylinders and pistons results in considerable saving in man-hours (p. 102), making it possible to clean from four to ten times as many parts in an 8-hour day compared to older methods. . . . Explanation of the tight steel supply situation is provided by statistical data for the first five months of the year (p. 57), shipments to consumers in period being off 10,474,260 net tons from the like months of 1945, chiefly because of production loss occasioned by strikes. . . . Machine tool builders anticipate improvement in export tool demand as result of loan to Britain (p. 58). Expectations are principal British imports will be machinery and raw materials. . . . Recent expressions on plans for nationalizing the British steel industry (p. 64) indicate the proposal is retarding proposed plant modernization. . . . Department of Commerce and the Reconstruction Finance Corp. are setting up new offices (p. 60) to service small business. Agencies will assume many functions formerly performed by Smaller War Plants Corp. and will offer wide variety of services. . . . Manufacturers on the Pacific Coast report difficulty in obtaining all the steel they require (p. 72) to step up production schedules. Principal cause of scarcity is attributed to withdrawal of eastern steelmakers from western markets. . . . In working aluminum, a single-action press is adequate for simple draws, but for deeper draws (p. 88) the pressure provided on the blankholder by a double-action press is required. . . . Petroleum equipment sales prospects are reported particularly bright in California (p. 73) where the oil industry is said to be showing extremely promising signs of expansion. . . . Difficulty of obtaining supplies of raw materials and components promptly is being overcome by the Piper Aircraft Corp. by operating (p. 70) its own air freight service, keeping more than 2500 different items moving into its plant to maintain a production rate of nearly 45 airplanes daily.

E. C. Shane

EDITOR-IN-CHIEF



Newly-rolled steel rails go under giant saws to be cut to proper length for track replacements at the Edgar Thomson Works of Carnegie-Illinois Steel Corp. at Braddock, Pa. Workmen at Edgar Thompson see the display of pyrotechnics every few minutes as rail production is pushed to meet the unprecedented demand

Railroad Rehabilitation Program Lags

Strikes and materials shortages hamper carriers in plans to restore properties to peak physical condition and operating efficiency. Four years of war took heavy toll in equipment. Rising costs cast shadow on prospects for profitable operations

By ERLE F. ROSS
Chicago Editor, STEEL

MUCH of the optimism which American railroads held at the beginning of 1946 that their requirements in replacement of rolling stock and maintenance of tracks might be met within a reasonable time now has been dissipated. Strikes in the steel and coal industries which cost more than 10,000,000 tons of finished steel products; strikes in the copper industry, which adversely affected the electrical industry; and strikes in the plants of locomotive and car builders and equipment suppliers, have combined to curtail and delay production. Prospect of unprofitable operations this year also casts a shadow over the future.

Virtually all carriers have projected ambitious programs to bring their properties up to peak physical condition and operating efficiency, partly to make up for ground lost during the war and partly to meet competition of other means of transportation. Four years of war took a heavy toll of equipment and during the entire period shortage of materials and manpower denied all but the most urgent improvement of facilities.

Reports to the bureau of transport economics and statistics of the Interstate Commerce Commission from 123 Class 1 railroads out of 137 show actual and estimated capital expenditures in the first three quarters of this year of $382,907,259, an increase of 19.6 per cent, compared with actual expenditures of $320,112,145 by the same roads in the like period last year.

Because equipment purchases and deliveries lagged from strikes and materials shortages, a larger share of expenditures in first quarter went to road improvements. For the first three months, the carriers spent 26.05 per cent of the three-quarters' total for road, against 16.91 per cent for equipment. In second quarter, the dollar amount of equipment expenditures rose abruptly, exceeding road expenditures but still equaling a smaller percentage of the three quarters' total than that spent on road.

Biggest bulge in equipment expenditures is anticipated for third quarter when the total is placed at $180,140,151, against $114,516,158 for road. Thus, the third quarter equipment expenditures alone will amount to 52.08 per cent of the total for both classes for the three quarters, while road in this period will take 40.25 per cent.

Another indication of emphasis laid on new equipment, possibly reflecting also some price increases, is the comparison of 1946 estimates with the actual in three quarters of 1945, showing a rise of 25 per cent this year. The rise in road expenditures on the same basis was 13 per cent.

It is not unlikely that actual expenditures over the remainder of this year may shrink appreciably below estimates, partly because of smaller than antici-

pated delivery of new equipment, but principally because the railroads are currently in unfavorable earning position. Operating in the red in first quarter and probably in first half, the carriers had requested a 25 per cent increase in freight rates. Interstate Commerce Commission granted a 6 per cent rate boost effective July 1, and deferred action on the 25 per cent request pending study.

Railroad circles describe the 6 per cent relief as disappointing and assert delay on the 25 per cent request may take the roads into red for the year. The immediate result will be the trimming of sails by reduction of capital expenditures. It is pointed out that earnings are suffering from the burden of higher wages, higher coal costs and reduced traffic volume.

Average straight time hourly earnings of Class 1 employees is now $1.101 per hour, an increase of 52.7 per cent from the 72.1-cent figure of 1939, as result of the recent 18½-cent wage increase. It is estimated this wage boost will cost the carriers $725 million in 1946. Higher coal prices will mean an increase of $48 to $50 million. As to reduced freight traffic, car loadings in the first 27 weeks this year aggregate only 19,695,000 as compared with 22,004,000 in the corresponding period of 1945.

Railroads Seen Indispensable

The war demonstrated how essential railroads are to the nation, their remarkable technological progress, and the importance of investment to provide better transportation at lower real cost. There is nothing in existence, or in sight, to take the place of trains of cars on tracks in transporting the vast volume of American commerce at rates which now and for some years past have averaged less than one cent for hauling a ton of freight a mile. Nevertheless, the railroads are not unmindful of more intense competition in the making.

Commenting on his situation a short time ago, Fred G. Gurley, president, Santa Fe System, Chicago, pointed out that the cushion which has enabled the railroads to reduce many competitive rates in face of rising wage and material costs and increased taxes has been increased productivity of the railroad plant. The latter comes from improvements in plant from large investments which have brought about new technology. It would be tragedy if railroads get so squeezed they cannot go forward with a program of modernization and improvement, he said.

Intense competition is anticipated, Mr. Gurley continues, by resumption of ocean shipping through the Panama Canal, trucks and busses, inland waterways, pipelines and airlines. Highway competition is the most serious and airlines the most spectacular.

To meet this competition, the railroads are acquiring new freight equipment; new locomotives, including diesels and new types of steam driven; new passenger cars, including diners, sleepers and chair cars; centralized traffic control; new bridges; heavier rails; and curvature reductions.

Carriers planned to buy 100,000 new freight cars this year, representing the heaviest freight equipment purchase program since 1941 with a total of 106,897. As of Jan. 1, 37,000 were on order. With restoration of the 5-day week in industry, 228,000 cars "went out the window," and in addition, many have been stalled behind picket lines. Actually ordered in the first five months this year have been 8895 cars, against 14,096 in the corresponding period of 1945. Rise in both delivery and orders in May rose over month before and year before levels. On June 1, Class I carriers had 39,483 new cars on order, compared with 31,283 a year ago.

Total freight cars placed in service from January through June aggregated only 14,723, against 18,818 in the same period of 1945. In the first five months this year, 101 new locomotives were placed in service, compared with 260 a year ago.

Rise in the number of freight cars awaiting repairs to 4.9 per cent from the war-time average of 3 per cent has induced Office of Defense Transportation to repeat its insistence that every effort be exerted toward reducing bad order cars to the minimum. The agency has offered assistance in solving the materials shortage problem. Chief among these problems is car lumber prices. Present reports show a serious shortage of box cars, refrigerators and hoppers. ODT states new cars must be obtained as quickly as possible, both to increase ownership and to replace equipment which should be retired, but meanwhile delays in car repairing must be remedied.

Average tonnage loading in 1945 was 39.89 tons, a loss of 0.38 tons, compared with 1944. Even this fraction of a ton required 329,848 more carloads than would have been needed had the 1944 figure prevailed. Based on the 1945 turnaround time 13,430 freight cars were needed to handle tonnage represented by the loss. Heavier loading in the war years—increases of between 3 to 11 tons over 1929—were due to ODT Order No. 18-A. Although some shippers have sought modification of the order, the government in late June served notice it would continue the wartime regulation in effect indefinitely, would tighten enforcement and would ban holding cars more than 24 hours.

For some weeks a box car shortage has existed in almost every section of the country and has caused considerable concern. The deficiency is traced directly to the movement of the bumper grain harvest in western states. In an effort to relieve the shortage, ICC early in June issued Order No. 369 providing increased demurrage on box cars held beyond the fourth day. By early July, the shortage had become more critical than during the war and ODT appealed for unloading on Saturdays to improve turnaround. At the same time, the agency predicted more serious shortage of cars in September and October. Currently, box car loadings are climbing steadily.

ODT reports that the supply of serviceable box cars has decreased to less



Shortage of box cars is causing thousands of bushels of wheat to rot on the ground throughout the western grain areas. Here, moist wheat is spoiling in northwestern Kansas. NEA photo

than 690,000, a loss of 33,000 since April 23. As a matter of fact, it is estimated that more than 300,000 of the nation's 1,770,000 freight cars of all kinds have passed the point at which they normally would have been retired. Not enough new units are being built to maintain replacements because of shortages of steel, lumber and other materials.

Steelmakers have felt the car shortage recently. Type of cars requested by customers is not always available. Frequently, cars are shorter than desired and some mills have asked steel consumers to specify their material in shorter lengths. Lack of box cars for tin plate and other highly finished products which require protection during transit has been particularly bothersome. At one time recently, Carnegie-Illinois Steel Corp.'s sheet and tin mill at Gary, Ind., had a cumulative shortage of 350 box cars. This subsequently was reduced to 250. Another distressing shortage occurred at the Joliet, Ill., plant of American Steel & Wire Co., where 45,000 kegs, or over 2200 tons of vitally needed nails were held in the shipping department awaiting cars. These since have been moved out.

Freight car loadings for third quarter are expected to be 2.7 per cent above third quarter of 1945; for the Middle West the increase is estimated at 4.4 per cent. By important products, the rises in loadings are figured as follows: Ore, up 5.7 per cent; iron and steel, 4.7; other metals, 5.8; machinery and boilers, 2.9; agricultural implements and vehicles other than automobiles, 20.7; and automobiles and trucks, 112 per cent.

Passenger Cars Also in Demand

Materials shortages and strikes also have held up the manufacture and delivery of new passenger equipment, none of which was built during the war except for the Army. Since V-J Day, purchases of streamlined passenger cars have exceeded the total placed in service in the country between 1934—start of the lightweight era—and beginning of the war. The railroads now are awaiting delivery of more than 2400 streamlined passenger cars. This backlog already is exceeding the 2300 put in service by the carriers and the Pullman Co. prior to 1942 and appears to be only a start.

In the yards and shops of Pullman-Standard Car Mfg. Co. three weeks ago were more than 150 coaches, complete except for electrical equipment, air conditioning, interior hardware, glass, roller bearings, seats, leg rests, etc. As parts arrive, cars are readied for delivery. Company had expected to turn out cars at the rate of seven each working day, but by July 1 had delivered only 82 postwar cars of more than 1200 on order. Strikes and work stoppages among suppliers have upset production schedules.

Edward G. Budd Mfg. Co. reports its production is gaining in direct proportion to relief of material shortages, and that it had delivered only 41 cars of all passenger and diner types by June 22. Orders on books total 575. American Car & Foundry Co. has a backlog of some 600 passenger cars.

Postwar cars, both freight and passenger, will incorporate radical changes in design and construction. An example is 2000 new refrigerators, recently authorized by Pacific Fruit Express Co. and placed with four car builders. These cars will utilize stronger metals, involve numerous structural changes and will weigh about 4000 pounds less than conventional refrigerators. United States Steel Corp. recently constructed and exhibited in a number of cities a new all-welded hopper car utilizing low-alloy, high-tensile steel. Weight is 6540 pounds, or 15 per cent, less than orthodox. Advantages claimed are larger pay loads, high strength and greater resistance to atmospheric corrosion.

Typical of the situation with locomotive builders is that of Baldwin Locomotive Works, which has unfilled orders totaling $95 to $100 million, and representing a moderately good year's business under normal peacetime conditions. This compares with the backlog at end of 1945 of nearly $83 million. More than half of present business, however, is for export. Billings so far are affected seriously by strikes at the company's plants and at suppliers' plants. Baldwin's own plants were virtually shut down 12 weeks.

Present, Past and Pending

■ COPPER NOW MUST BE LICENSED FOR EXPORT

WASHINGTON—Copper in all forms, and electric exterior lighting fixtures and parts have been added to the Positive List of Commodities of the Office of International Trade, effective July 18, and now require individual licenses for export.

■ LARGE NAIL TONNAGE TO BE MADE AVAILABLE

WASHINGTON—Approximately 12 million pounds of Army and Navy nails will become available for the veterans emergency housing program within the next 30 days, Lt. Gen. Edmund B. Gregory, War Assets administrator, and Wilson W. Wyatt, housing expediter, announced last week.

■ SURPLUS STEEL SALE CONTINUES THROUGH JULY 31

DETROIT—Sale of approximately 40,000 tons of surplus billets, bars, blooms, strips, sheets, tubing and other steel products currently is being held, open to all classes of buyers, at Warehouse No. 8 of the WAA, 5718 Russell St., Detroit. Material comprises both carbon and alloy, and carries prices below the mill level. Sale continues through July 31.

■ MORE THAN 133,000 WAR CONTRACTS SETTLED

WASHINGTON—More than 133,000 war contracts have been terminated by the War Department, the major portion of them in the ten months following V-J Day, and of these more than 130,000 have been entirely settled.

■ GENERAL MOTORS PRODUCTION HITS POST-STRIKE HIGH

DETROIT—General Motors Corp. production for the week ended July 13 moved up to 23,332 cars and trucks, a new post-strike high. Strikes in suppliers plants are now down to 56.

■ FORD TOP PERSONNEL STILL BEING RESHUFFLED

DETROIT—Another reshuffling of top administrative personnel at Ford Motor has followed entrance of E. R. Breech as executive vice president. Harold T. Youngren has been named director of engineering succeeding R. H. McCarroll who becomes director of chemical and metallurgical engineering and research. Lewis D. Crusoe has been named a member of the executive staff reporting to Mr. Breech.

■ PETTIBONE MULLIKEN ACQUIRES BUCKET MAKER

CHICAGO—As a further step in its postwar diversification program Pettibone Mulliken Corp., this city, has acquired the Daniels Murtaugh Co., Cedar Rapids, Iowa, manufacturer of heavy duty dragline buckets.

■ AFRICAN COPPER MINES CLOSED BY STRIKE

NEW YORK—Reports from London are to the effect the world shortage of copper is being further aggravated by a strike which is closing down operations in the important Northern Rhodesian copper field. Suspension of the various properties will cut off about 20,000 tons of copper a month from world supply.

Union Leaders Bewildered by Free Economy

Unexpected expiration of wage and price controls makes strategy uncertain. Leaders talk buyers' strikes, more pay

CATAPULTED back into a comparatively free economy by the expiration of wage and price controls, organized labor is finding its new circumstances bewildering.

Union leaders now are in a position where they can obtain what they are strong enough to take, without let or hindrance by government bureaus. However, union members have just witnessed a demonstration of the effect on prices of sharp increases in wages, without an accompanying increase in production.

What labor will do under the new circumstances remains one of the unpredictables of the transition from a controlled to a free economy. Top CIO officials assembled in Washington last week to map their strategy, convinced that effective price control is ended.

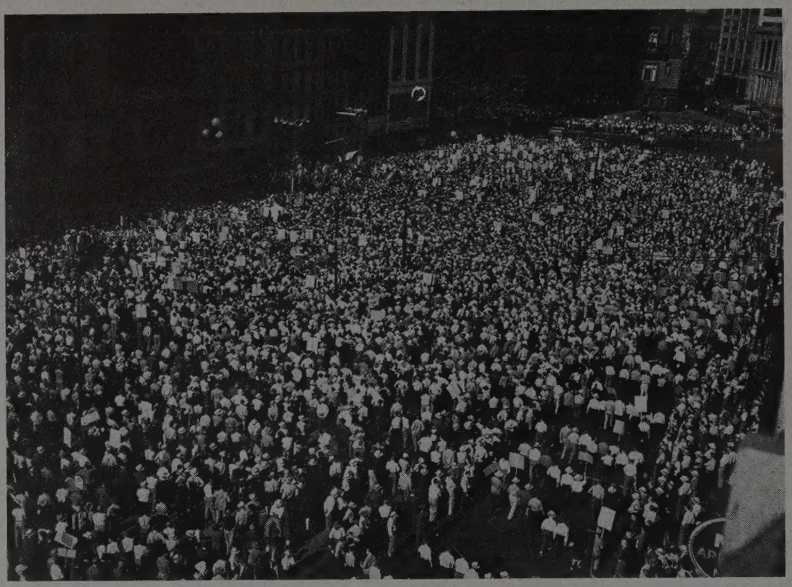
On the basis of union pronouncements, CIO strategy likely will be twofold: 1. To attempt mass action to combat price rises by means of mob demonstrations and attempted buyers' strikes; 2. to match increases in the cost of living by further wage increases.

Demonstrations Prove Disappointing

A large-scale experiment in holding mass demonstrations and attempting to organize buyers' strikes was conducted last week by the United Automobile Workers which held rallies in leading production centers. Attendance at these rallies was disappointing compared with the union's advance predictions. In Detroit, where the largest crowd turned out, attendance fell far below expectations, police estimating the crowd at 20,000 against advance predictions of 200,000. Plants of Chrysler Corp. and Briggs Mfg. Co. were the only large units suspending operations. Ford and General Motors divisions continued work on virtually a normal basis.

At Cleveland, 40,000 left their jobs under union instruction but only 2000 showed up for the demonstration. The Toledo rally attracted 3000, while at Chicago an equal number turned out.

Evidence of resistance to higher prices on meat, butter and other essential food items was noted in most large cities last week. These food items were backing up in retail outlets and some softening of price was noted. Generally, this was attributed to a reluctance on the part of all housewives to pay the sharply increased prices and not a result of the union's encouragement of a buyer's strike.



An estimated 20,000 persons attended the UAW-CIO rally in Detroit at which union leaders asked for a buyers' strike in an effort to save price controls. Although the Detroit demonstration was the largest in the country, the attendance fell far short of the 200,000 which the union had predicted. NEA photo

That higher wages will be asked to compensate for higher living costs has been a standard pronouncement of the unions. If consumer prices continue to go up the unions will prepare to reopen contracts and renegotiate wage rates.

Although it has been generally assumed that contracts negotiated early this year extend into 1947, the Department of Labor finds that a majority of them can be reopened during the life of the contract. In a sample of 99 wage agreements filed with the department, the Bureau of Labor Statistics found that 71 of these key agreements permit renegotiations.

These 71 agreements cover about 1,136,000 wage earners or 72 per cent of the 1,576,000 wage earners covered by the entire sample of 99 contracts. The agreements are divided into two groups. One allows the reopening of wage clauses for any reason at any time or on a specified number of days' notice. The second group restricts the reopening of the agreements to specified conditions such as (1) in the event of a change in the cost of living; (2) in event of a change in the national wage stabilization policy; (3) in the event of general wage changes in the particular industry or area.

The agreements selected as a sample were taken because they are regarded as setting the pattern for wages and working conditions in their respective industries.

Economic observers are hoping that organized labor will proceed slowly in demanding wage increases until the effects of increased production can be seen in the market place. They point out that six months or a year of high production would do much to keep prices at a reasonable level. At the same time they warn that another period of wage renegotiations, which inevitably would be accompanied by some work stoppages, would retard production and accentuate the shortage of goods which now is the largest factor in pushing prices up.

Contributing to the hope that serious labor disturbances may be avoided this fall is the knowledge that the largest and costliest wave of strikes in history is barely behind us and that individual union members are not in a favorable position to face long periods of wageless idleness.

$60 Million in Surplus Goods Will Be Offered

A large warehouse in Hammond, Ind., where some $60 million worth of goods have been collected by WAA for the biggest single sale of surplus war property thus far in this area was opened July 18 for preliminary inspection by interested buyers. About 70 per cent of the property consists of capital and producer goods, including a large amount of heavy machinery used in war plants.

The sale will begin July 29 when representatives of the government agencies

will have first opportunity to make purchases under the priority system. It will continue through Aug. 15 at which time sales will be made to commercial dealers, jobbers and manufacturers. Although the priority system will be followed, a new procedure, known as "sales at sites," will be used to speed distribution. Under this method, the purchaser will be able to pick out his goods, pay his bill, and arrange for shipment in short order.

Veterans of World War II, who hold second priority rights on surplus property, will be given an exclusive opportunity to inspect the property July 30. Sales will be made Aug. 5-9 to veterans who have certificates.

Sale will be open to representatives of RFC Aug. 12 for making purchases for small business establishments—those having less than 500 employes and which are not dominant in their field or affiliated with dominant organizations. Purchases by state and local governments will be made Aug. 13 and by nonprofit, tax-exempt institutions, Aug. 14.

Approximately 100 diesel generating units, each capable of producing 10,000 watts of electricity, are included in the surplus goods. Only automotive vehicles offered are nine special shovel trucks equipped with cranes and winches; however, WAA states these will be purchased quickly by federal agencies or veterans priority groups.

Woman Appointed Acting Commissioner of the BLS

Mrs. Aryness Joy Wickens, chief of the price and cost-of-living branch of the Bureau of Labor Statistics, has been named acting commissioner of the bureau to succeed A. Ford Hinrichs. Mr. Hinrichs had been acting commissioner since June, 1940. In his letter of resignation to Secretary of Labor Schwellenbach, Mr. Hinrichs stated he no longer could remain in an "acting" capacity once it was clear that he was not to be appointed to the top post.

In addition to being kept in a subordinate position Mr. Hinrichs also encountered much unpleasantness due to CIO and AFL attacks on BLS statistics, particularly the BLS cost-of-living index, also to attacks by these organizations on him personally. The next commissioner is expected to be a man with strong labor backing; sources in the Labor Department say a likely candidate for the post is Murray Latimer, formerly chairman of the Railroad Retirement Board and at present a member of the Guaranteed Wage Study Staff of the Office of War Mobilization and Reconversion.

Canadian Steel Strike Fails To Halt Production Completely

Union orders walkout in defiance of government operation. Demands pay boost, 40-hour week and vacations with pay. Thousands of workers stay on job. Strikers face fines of $20 daily for each day of stoppage

TORONTO, ONT.

STRIKES were called at the three Canadian basic steel companies July 15, affecting some 15,000 workers. While the plants of Algoma Steel Corp., Sault Ste. Marie, and Dominion Steel & Coal Corp., Sydney, N. S., are idle, the Steel Co. of Canada is maintaining production with some 2000 men who refused to join the strikers and are being maintained within the Hamilton plant ground.

About a week ago all three basic steel plants were taken over by the federal government and F. B. Kilbourn of Montreal was appointed controller. Despite the government's action union leaders called the strike.

The union demands a 40-hour week with a minimum wage of $33.60 weekly which means an increase of 19½ cents an hour at the Algoma and the Steel Co. plants, and 24½ cents an hour at Sydney. The union also asks for two weeks' vacation with pay. At Hamilton the union announced they had received an unofficial offer of an increase of 10 cents an hour retroactive to Apr. 1 with an additional 2 cents an hour starting Nov. 1. At Sault Ste. Marie workers announced they had received an offer of 8 cents an hour before the controller's offer of 10 cents an hour was made. At Sydney an increase of 5 cents an hour on top of the 10 cents an hour offered employees by Controller Kilbourn was made.

Strikers Risk Large Fines

The strike is in direct defiance of the government which had seized the three big steel plants, thus the workers face fines of $20 a day for every day they are on strike and any one persuading them to strike is liable to a $500 penalty for leaving a plant under the control of a federal employee. However, to this time there is no indication that the government will endeavor to prosecute or collect any of the fines.

At the Hamilton plant of the Steel Co. of Canada an estimated 2000 or more workers are living inside the plant and defying the picket line.

In a telegram to Labor Minister Humphrey Mitchell, H. G. Hilton, president, Steel Co. of Canada, announced that, "Coke production is practically normal; one blast furnace is operating; No. 2 open hearth plant, comprising nine of the largest furnaces out of a total of 13, as well as the large electric furnace, are operating; the bloom and billet mills are operating on schedule; the bar mill and rod mills are operating and the company expects to operate the plate mills immediately."

While the main Hamilton works continue in operation the Canada works and the Ontario works, two fabricating plants of the Steel Co. of Canada employing 1100 workers have been shut down. Other Steel Co. works which may be affected by the strike are at Brantford, Toronto, Gananoque in Ontario, and St. Henri, Lachine, and Notre Dame in Montreal. These plants employ about 8000 workers.

Production of Iron, Steel In Canada Rises in May

Iron and steel production in Canada during May reached the highest total for any month of the year to date.

Pig iron output amounted to 159,101 net tons against 142,240 tons in April. Output included 130,224 tons of basic iron of which 127,463 tons were for further use of producing companies and 2761 tons for sale; 16,595 tons of foundry iron of which 172 tons were for further use and 16,423 tons for sale; 12,282 tons of malleable iron all of which was for sale.

Production of ferroalloys in May also made a high record for the year at 14,004 tons and included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrome-x and ferrophosphorus.

Production of steel ingots and castings in May totalled 259,626 net tons and included 251,697 tons of ingots and 7,929 tons of castings.

Production of pig iron, ferroalloys, steel ingots and castings for the first five months of this year were down from the corresponding period of 1945. Following are comparative production figures in net tons:

	Steel Ingots Castings	Pig Iron	Ferro-alloys
May, 1946	259,626	159,101	14,004
April, 1946 ...	247,519	142,240	13,083
May, 1945	267,643	155,574	19,883
5 mos. 1946 ..	1,234,778	746,133	57,242
5 mos. 1945 ..	1,338,503	782,917	80,119
5 mos. 1944 ...	1,271,833	787,624	73,336

Scrap Shortage Threatens Sharp Steelmaking Cut

Some production already being lost as supplies are withheld from market. Receipts only 35 per cent of needs

SHARP reduction in steel mill operations within the next few weeks as result of a serious reduction in the movement of scrap to mills is expected by steel producers.

Already some steel production is being lost because of the acute shortage of scrap, which has grown worse recently because certain normal sources of supply have been withholding scrap tonnages from the market following the expiration of price controls. Some producers say the national ingot rate may fall to 50 per cent of capacity in August unless scrap supplies are increased. At least 12 open hearths were idle last week and more will go down this week.

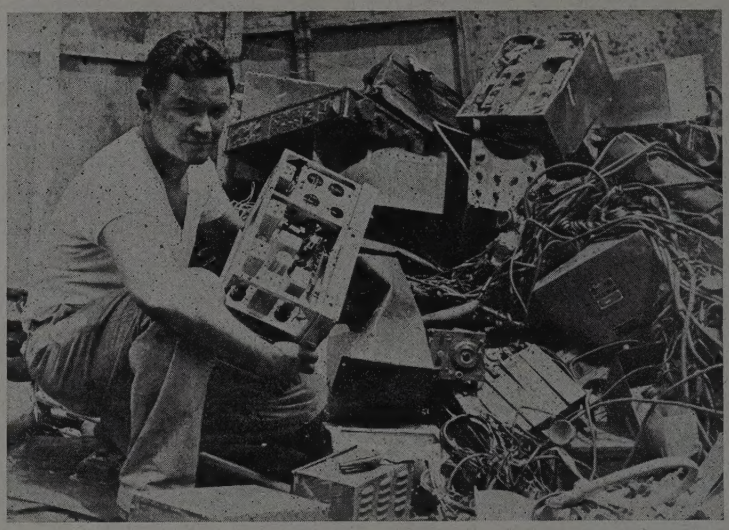
Carl A. Ilgenfritz, vice president in charge of purchases, Carnegie-Illinois Steel Corp., Pittsburgh, and vice chairman of the American Iron & Steel Institute scrap committee, last week said that a number of open hearths over the nation cannot be put into operation because of the shortage of scrap.

"Inventories of scrap at steel mills average only 10 to 14 days' supply at present and in some cases it is reported that certain plants have only one or two days' inventory.

"Incoming shipments of scrap have declined to 35 to 40 per cent of requirements. That means steel mills are being forced to draw upon inventories which are dwindling rapidly.

"Unless receipts of scrap improve quickly, the steel industry will be forced to take open hearths out of operation, with the result that for months to come consumers may find it increasingly difficult to obtain steel. It is imperative that everyone help to start the scrap flowing promptly."

During the steel strike early this year, steel mills were unable to accumulate much scrap because many metalworking companies were down or on sharply curtailed schedules due to lack of steel and therefore were generating little scrap. Throughout the coal strike, there was a heavy drain on scrap supplies as steelmakers used more of this material to offset the loss of pig iron when blast furnaces suspended for lack of fuel.



BARGAIN: Milner LaHatte, Atlanta, Ga., inspects a high-frequency combination transmitter-receiver which he bought at the Atlanta Steel & Supply Co. for $10. The equipment was part of 80 tons which was broken up and sold by the Army Air Forces as scrap at $12.88 a ton. Mr. LaHatte, a radio man, was able to buy this valuable piece of equipment for 20 cents a pound. It cost the taxpayers between $100 and $200. NEA photo

Expiration of the Office of Price Administration injected uncertainty concerning the future of scrap prices and many suppliers of scrap, both dealers and metalworking firms which generate scrap, are reported holding their supplies in anticipation of a price increase.

Sales of cast scrap at above the old ceilings are reported, but steelmakers generally are resisting higher prices for scrap as part of their program to hold prices fairly stable.

A 10-point program to speed the movement of scrap to mills was announced last week by the federal government and this program is expected to be broadened. However, steelmakers are dubious as to how soon any considerable tonnage of scrap will be made available through the government's plan.

Briefly the program provides:

1. Civilian Production Administration will authorize the War Assets Administration to lease surplus Navy and Maritime shipyards and other ship scrapping facilities to private operators.

2. Navy and Maritime Commission will list immediately all facilities suitable for ship breaking.

3. Navy and Maritime Commission will make several hundred surplus ships available immediately for scrap salvage.

4. Army will notify overseas commanders of the urgent need for scrap and instruct them to speed the return of military scrap wherever possible.

5. Navy has directed commanders of all Navy yards and other installations to place all available scrap on market immediately.

6. Maritime Commission will urge operators of ships returning empty to this country to load as much military scrap for ballast as they can obtain in foreign ports.

7. Army will endeavor to expand its program of demilitarizing live ammunition and equipment.

8. Joint War Department-CPA study will seek to determine extent to which alloy steel in guns, tanks and armor plate can be used in civilian steel production.

9. All agencies of the government will start an intensive scrap housecleaning drive. Practice of accumulating piles of scrap before calling for bids will be discontinued during the emergency.

10. WAA will accelerate sales of surplus machine tools.

This program by the government probably will be extended to include intensified efforts for the collection of dormant scrap on farms, at industrial plants and auto graveyards.

Industry spokesmen doubt that substantial quantities of scrap can be moved to the mills in the critical weeks immediately ahead. They point out that every possible source must be tapped—the railroads, industrial plants and dealers—to keep the industry operating. Otherwise, operations will fall and the steel scarcity will continue to retard manufacturing activity.

Consumers Get 10,474,260 Fewer Tons of Steel in First 5 Months

SHIPMENTS of steel into consumption during the first five months of this year were 10,474,260 net tons less than in the comparable period in 1945, according to figures compiled by the American Iron & Steel Institute.

Cumulative shipments for this year to June 1 totaled 18,051,360 tons, compared with 28,525,620 tons in five months last year. The totals represented an average operating rate of 62.7 per cent of effective finishing capacity for the 1946 period and 93.4 per cent for the 1945 period.

The decline in shipments is attributable to interference by the steel and soft coal strikes.

Total shipments in May were 3,906,064 tons, at 67.4 per cent capacity, compared with 4,698,081 tons in April, at 82.3 per cent. In May, 1945, total shipments were 5,938,055 tons, at 94.7 per cent.

Shipments to members of the industry for conversion into further finished products in May were 239,387 tons, compared with 362,387 tons in April.

Practically all classifications of steel suffered losses in May, compared with April. Exceptions were cold-rolled sheets, shipments of which were 350,763 tons in May and 325,609 tons in April; hot-rolled strip, 117,720 tons in May, 117,304 tons in April; cold-rolled strip, 120,953 tons in May, 118,200 tons in April.

Structural shapes declined from 340,055 tons in April to 201,236 tons in May; plates from 383,584 tons to 281,697 tons; standard rails from 152,385 tons to 96,594 tons; hot-rolled bars from 723,826 tons to 597,278 tons; cold-rolled bars from 141,100 tons to 116,140 tons; nails and staples from 55,620 tons to 51,457 tons; hot-rolled sheets from 550,724 tons to 517,302 tons; galvanized sheets from 129,374 tons to 122,904 tons; hot-dipped tin and terne plate from 170,910 tons to 158,545 tons and electrolytic tin and terne plate from 93,821 tons to 82,019 tons.

Average Hourly Wage Hits New High in Steel Industry

A new record for average hourly, piecework and tonnage wages in the steel industry was set in May. The record, 135.8 cents an hour, compares with the previous high of 135.1 cents an hour set last March.

Employment, average hours and payroll figures declined in May from the previous month, reflecting effects of the coal miners' strike. Average number of employees in May was 562,900, compared with 581,800 in April. Wage earners worked an average of 32.6 hours a week during May and 37.2 hours a week in April. Total May payroll for the industry was $121,422,200, compared with $134,347,800 the previous month.

AMERICAN IRON AND STEEL INSTITUTE
CAPACITY, PRODUCTION AND SHIPMENTS

Period MAY - 1946

Steel Products	Number of companies	Items	Maximum Annual Potential Capacity Net Tons	Current Month: Production Net Tons	Current Month: Production Per cent of capacity	Current Month: Shipments (Net Tons) Total	Current Month: Shipments (Net Tons) To members of the industry for conversion into further finished products	To Date This Year: Production Net Tons	To Date This Year: Production Per cent of capacity	To Date This Year: Shipments (Net Tons) Total	To Date This Year: Shipments (Net Tons) To members of the industry for conversion into further finished products
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	39	1	xxxx	xxxx	xxx	195,850	86,776	xxxx	xxx	* 1,230,677	587,065
Structural shapes (heavy)	12	2	9,421,550	178,704	23.2	201,236	xxxx	1,077,257	28.9	* 1,142,422	xxxx
Steel piling	4	3		6,748		7,501	xxxx	49,208		41,364	xxxx
Plates (sheared and universal)	27	4	17,080,770	262,791	18.1	281,697	18,738	1,414,570	20.0	1,432,920	97,184
Skelp	5	5	xxxx	xxxx	xxx	9,289	6,916	xxxx	xxx	133,350	59,357
Rails—Standard (over 60 lbs.)	4	6	3,657,000	89,220	28.7	96,594	xxxx	549,428	36.3	550,517	xxxx
—All other	5	7	392,000	11,439	34.3	11,917	xxxx	50,081	30.9	50,374	xxxx
Splice bars and tie plates	12	8	1,745,960	39,931	26.9	44,230	xxxx	216,348	29.9	235,007	xxxx
Track spikes	10	9	349,400	11,280	38.0	12,274	xxxx	49,757	34.4	53,955	xxxx
Hot Rolled Bars—Carbon	33	10	xxxx	454,679	xxx	386,238	38,059	2,317,665	xxx	* 1,940,602	241,501
—Reinforcing—New billet	15	11	xxxx	80,033	xxx	80,613	xxxx	320,524	xxx	* 342,825	xxxx
—Rerolled	12	12	xxxx	15,797	xxx	13,936	xxxx	50,169	xxx	51,037	xxxx
—Alloy	22	13	xxxx	121,287	xxx	116,491	10,741	551,705	xxx	464,645	47,791
—Total	39	14	21,906,660	671,796	36.1	597,278	48,800	3,240,063	35.7	* 2,799,109	289,292
Cold Finished Bars—Carbon	24	15	xxxx	98,474	xxx	99,390	xxxx	468,553	xxx	468,565	xxxx
—Alloy	23	16	xxxx	19,193	xxx	16,750	xxxx	78,316	xxx	69,146	xxxx
—Total	31	17	2,851,510	117,667	48.6	116,140	xxxx	546,869	46.3	537,711	xxxx
Tool steel bars	18	18	255,010	10,207	47.1	10,016	xxxx	42,282	40.1	41,475	xxxx
Pipe & Tubes—Butt weld	14	19	2,176,520	108,636	58.7	110,605	xxxx	490,072	54.4	482,021	xxxx
—Lap weld	9	20	730,200	15,200	24.5	21,239	xxxx	93,292	30.9	108,358	xxxx
—Electric weld	10	21	1,536,900	58,170	44.5	46,245	xxxx	260,806	41.0	215,932	xxxx
—Seamless	13	22	3,169,600	173,035	64.3	159,196	xxxx	767,745	58.5	683,118	xxxx
—Conduit (cap. & prod. incl. above)	6	23	xxxx	xxxx	xxx	6,975	xxxx	xxxx	xxx	31,945	xxxx
—Mech. tubing (cap. & prod. incl. above)	11	24	xxxx	xxxx	xxx	40,755	xxxx	xxxx	xxx	161,843	xxxx
Wire rods	25	25	7,293,670	339,152	54.7	69,156	23,940	1,537,441	50.9	368,119	133,642
Wire—Drawn	39	26	5,702,890	286,030	59.0	178,009	11,896	* 1,214,899	51.5	* 709,567	50,244
—Nails and staples	18	27	1,260,360	50,837	47.5	51,457	xxxx	206,286	39.5	206,493	xxxx
—Barbed and twisted	15	28	543,610	18,862	40.8	18,705	xxxx	80,710	35.9	79,177	xxxx
—Woven wire fence	15	29	1,121,860	33,687	35.3	33,205	xxxx	146,623	31.6	146,719	xxxx
—Bale ties	12	30	149,700	7,612	59.8	8,173	xxxx	28,948	46.7	31,315	xxxx
Black Plate—Ordinary	9	31	xxxx	xxxx	xxx	64,765	124	xxxx	xxx	* 297,652	789
—Chemically treated	8	32	465,000	10,986	27.8	11,661	xxxx	54,517	28.3	54,223	xxxx
Tin and Terne Plate—Hot dipped	9	33	3,758,850	167,990	52.6	158,545	xxxx	645,232	41.5	690,534	xxxx
—Electrolytic	9	34	2,231,850	84,825	44.7	82,019	xxxx	319,031	34.5	330,615	xxxx
Sheets—Hot rolled	30	35	19,353,320	1,128,815	68.7	517,302	24,667	4,804,734	60.0	* 2,126,165	139,611
—Cold rolled	13	36	7,127,460	456,750	75.4	350,763	xxxx	1,902,977	64.6	1,387,375	xxxx
—Galvanized	16	37	2,924,130	113,518	45.7	122,904	xxxx	527,173	43.8	533,045	xxxx
Strip—Hot rolled	25	38	7,180,030	186,299	30.5	117,720	17,530	830,640	28.0	536,664	80,627
—Cold rolled	34	39	3,067,450	123,043	47.2	120,963	xxxx	488,723	38.5	480,594	xxxx
Wheels (car, rolled steel)	5	40	315,400	19,232	71.8	21,297	xxxx	87,980	67.4	94,154	xxxx
Axles	6	41	398,170	8,405	24.8	9,840	xxxx	43,219	26.2	44,890	xxxx
All other	3	42	169,510	3,874	26.9	553	xxxx	17,776	25.3	1,961	xxxx
TOTAL STEEL PRODUCTS	140	43	xxxx	xxxx	xxx	3,906,064	239,387	xxxx	xxx	*18,051,360	1,437,811
Effective steel finishing capacity	140	44	64,059,000	xxxx	xxx	xxxx	xxxx	xxxx	xxx	xxxx	xxxx
Percent of shipments to effective finishing capacity	140	45	xxxx	xxxx	xxx	67.4%	xxxx	xxxx	xxx	62.7 %	xxxx

* Adjusted.

British Loan Is Viewed as Spur To Tool Exports

Principal imports from United States likely to be machinery and raw materials. Specialized equipment needed most

MANUFACTURERS of machine tools and equipment in the United States are interested in the developments of international trade consequent on the loan by this country to Great Britain recently consummated.

Some time will be required for Great Britain to work out its financial obligations with other countries, to settle sterling balances accumulated during the war. However, the question of what American industries will benefit directly from the loan is concerned principally with the matter of import licenses as import restrictions must be maintained until a balance is reached.

Principal imports probably will be machinery and raw materials, as reconstruction calls for these in large quantity. Specialized machine tools and equipment are likely to be the main items, as these will aid in production of articles for export. This will include equipment for automobile manufacturers, who are in need of special machinery, including die-sinking equipment and presses to rehabilitate their plants.

Another likely class of imports is steelmaking equipment, rolling mills and other production machinery. Great Britain's capacity for producing steel materials is inadequate at present to meet more than domestic needs and to export she must increase capacity.

Other equipment likely to be imported includes automatic looms and other textile machinery for the cotton industry, which is now in the hands of a commission to prepare plans for reconstruction to meet modern needs. Coal mining probably will be mechanized, offering opportunity for use of American machinery, which has been developed to a high degree to increase tonnage.

All these possibilities of British imports are dependent on formation of an international code of commercial conduct, having to do with tariff preferences, cartels and subsidies. The matter of a code will be discussed in October at a meeting in London participated in by major trading countries, with a second meeting in 1947 to formulate actual terms of the code. The latter would later be submitted for ratification to a formal international conference on trade and employment.



BRITISH LOAN APPROVED: The $3,750,000,000 British loan, largest peacetime financial credit ever extended by one nation to another, has been approved. Above, Undersecretary of State Dean Acheson, left, congratulates House members who led the fight for passage. Left to right: Mr. Acheson; Rep. Brent Spence (Dem., Ky.); Rep. Jesse P. Wolcott (Rep., Mich.); Rep. John W. McCormack (Dem., Mass.); Rep. Wright Patman (Dem., Tex.). NEA photo

Conflicting Trends Noted in Tool Demand at Cincinnati

Cincinnati—Conflicting trends are noted in machine tool ordering in recent weeks. Buyers are showing less interest in smaller, less expensive tools and undoubtedly some of this demand has been satisfied from the surplus WAA offerings.

The pace of ordering in some of the larger tools, few of which were found in the surplus catalogs, has been maintained on demand from both domestic and foreign sources.

Prices generally are steady but in contracts manufacturers are protecting themselves against possible increases in cost of electrical equipment.

Rebound in Ordering Thought Unlikely in Third Quarter

Boston—Slackening in new machine tool orders in second quarter, notably in June, is not likely to rebound to the early year volume in the third. Restoration of some of the earlier industrial expansion programs, since postponed, or heavier production in others, will ultimately bring out orders originally scheduled.

Backlogs based on current assembly schedules which have long since eliminated overtime are sufficient for four to five months and center substantially in special purpose tools with many shops.

Bulk of new buying is still in special machines for specific jobs of metal cutting as in surplus offerings this type of tool is scarce. More standard machines are plentiful. Procurement of components and fixtures is a more serious production problem than steel, although castings are a major shortage with some and becoming more difficult.

Canadian Surplus Tools Bring 40 Cents on Dollar

Washington — Disposal of Canadian surplus machine tools is netting 40 cents on the dollar, according to a report from American sources on the subject.

Since the beginning of the sales program, it is stated, sales of surplus machine tools in Canada have totaled between $4 million and $6 million, Canadian, with a slight falling off in demand in the past few months. Sales of new tools have gained correspondingly, it is stated.

British makers are shipping tools to Canada in limited quantities, it is said, though these manufacturers are heavily booked with orders from their own, as well as Belgian and French buyers.

Westinghouse Production Rising Rapidly

President Gwilym A. Price says effects of strike being overcome with labor productivity increased considerably

IN A RECENT interview in New York with top Westinghouse Electric Corp. officials, including Gwilym A. Price, president, L. E. Osborne, executive vice president, and A. H. Phelps, vice president in charge of purchases and traffic, Mr. Price said plant productivity had increased considerably in the two months elapsing since May 13 when the 4-month strike ended.

Average production now is at 80-90 per cent of where it had been scheduled to be had the strike not taken place.

East Pittsburgh, South Philadelphia and Sharon plants, are producing heavy equipment such as motors, generators, transformers, turbines, now at 100 per cent of anticipated production.

Attitude of workers toward jobs also has improved as reflected in reduction of absenteeism. Quality of work also is better as indicated by fewer rejects.

Only two labor flareups have occurred since May 13—one at the Trafford Foundry and the other in Micarta Division—and these have been settled by adjusting time values which were out of line.

Westinghouse has a large order backlog for both capital and consumer goods and plant capacities are being increased sharply. Small motor capacity will be double prewar by the end of the year and may be increased further. Distribution transformer capacity is being tripled.

Consumer backlogs are regarded "sound" for the next six months to year. Material shortages are expected to continue for 1½ to 2 years and now necessitate considerable improvising to keep production going.

Mr. Price opposes extension of OPA on the basis that the mass production industries must produce goods at low selling prices to retain their market.

Daily Rate of Zinc Output Falls 3 Per Cent in May

Although total mine production of zinc in May remained relatively unchanged from April, the average daily rate of output declined 3 per cent, according to the Bureau of Mines, Department of the Interior. Average daily production was 1536 short tons compared with 1582 tons in April. Total monthly production was 47,615 tons compared with April production of 47,465 tons and 1945 monthly average of 51,000 tons.

CPA Farm Equipment Export Order Opposed by Builders

Farm equipment manufacturers, including the International Harvester Co., the Oliver Farm Equipment Co. and the Caterpillar Tractor Co., are reported as disapproving a recent Civilian Production Administration order requiring the export of 14,500 American-built tractors to five Russian dominated and two other eastern European countries.

The order, it is claimed, upsets the companies' export programs for the remainder of the year and reduces tractor allocations to great food producing countries such as Argentina, Australia, Canada and Brazil. Also, it is said, it will adversely affect domestic distribution.

In the case of the Harvester company, its quota is 5478 tractors, including 5198 wheel or farm type needed urgently by American farmers, and 280 crawler or track type, to be divided largely among Poland, Jugoslavia, Albania, Czechoslovakia, and Romania. Also the company must send repair parts in amounts totaling 10 per cent of the value of all tractors shipped in any one month.

The company is reluctant to reduce its domestic distribution because it is behind on these orders and because it is skeptical of the results of the CPA program. Skepticism is based on the lack of service and training facilities in Russian dominated countries and the apparent lack of any provision for related implements for tractors to pull, including combines, harrows, mowers and grain drills.

Government Sets Up New Technical Services Office

An Office of Technical Services has been established in the U. S. Department of Commerce to consolidate the work of the Office of the Publication Board, Technical Industrial Intelligence Branch, National Inventors Council, and Production Research and Development Division.

The new office is headed by John C. Green, who has served as executive secretary of the Publication Board and chief engineer of the National Inventors Council.

The OTS, which will launch a new program of technical aid to business and industry, consists of four major divisions: Invention and Engineering, Industrial Research and Development, Library and Reports, and Technical Industrial Intelligence.

Rise in Output of Remelt Aluminum Ingot Reported

Aluminum ingot makers produced 15,854 tons of remelt aluminum ingot in April, compared with 14,500 tons in March, according to the U. S. Bureau of Mines. Despite temporary setbacks due to reconversion and labor troubles, activity in the industry for the six months preceding May 1 had a rising trend.

Lead Output Down Sharply, Bureau of Mines Reports

Production of lead in May declined to 25,022 short tons, 23 per cent below the monthly average production in 1945, the Bureau of Mines has announced. Except for the period 1932 to 1934 inclusive lead output was lower than the average monthly production of any year since the Bureau of Mines began compiling mine production statistics in 1907.

Government Control Digest

Summaries of orders issued by reconversion agencies. Symbols are designations of orders, official releases

WAR ASSETS ADMINISTRATION

Strategic Stock Piling: Recision date of Surplus Property Administration Regulation 17, Nov. 16, 1945, entitled "Stock Piling of Strategic Minerals, Metals, and Materials" as amended through March 30, 1946, has been changed from July 1, 1946, to Aug. 1, 1946. (SPA Reg. 17, Amdt. 3; WAA-6)

CIVILIAN PRODUCTION ADMINISTRATION

Electrical Supplies: To aid the housing program, the CPA has extended its priority assistance to manufacturers of electrical wiring devices, such as sockets, lampholders, lamp receptacles, convenience outlets, toggle switches, wall and face plates, box connectors, and outlet, switch and receptacle boxes. Under amended Schedule 1 to Priorities Regulation 28, wiring device manufacturers can be granted CPA ratings for production materials, certain capital equipment, and materials and equipment required for maintenance, repair and operation. (PR-28, Schedule 1; CPA-472)

Lead Mines, Smelters: Priorities assistance of CPA to obtain capital equipment and materials for new development work may be used now by lead mines and smelters. (PR-28, Schedule 1; CPA-LD-138)

Insecticides: To maintain peak production of insecticides, the CPA has announced a temporary plan to provide manufacturers with the quantities of lead they need at the time they can process it. Through Sept. 30, insecticide makers must receive written CPA permission before using lead. (L-354; CPA-LD-141)

Windows of Washington

Department of Commerce and Reconstruction Finance Corp. set up new offices to service small business. Agencies will assume many functions formerly performed by Smaller War Plants Corp. Offer wide variety of services

TWO new government agencies created specifically to service small business are in the organizational stage in Washington.

One is the Office of Small Business of the Department of Commerce. The other is the Small Business Division of the Reconstruction Finance Corp. They are charged with the responsibility of placing all the resources of these two large government institutions at the disposal of small business.

To some degree the creation of the two new offices has resulted from redistribution early this year of the functions of the liquidated Smaller War Plants Corp. But it is a logical development for at least two other reasons: First, Congress has ordained that the government do everything possible to foster and encourage small business; second, at least 95 per cent of the work of the Commerce Department and the RFC always has been in the interest of "small business."

Secretary of Commerce Wallace and RFC Chairman Henderson consider desirable the setting up of special groups identified with the "small business" label and to co-ordinate, supervise and initiate services to small business.

Director of the RFC Small Business Division is Chauncey Y. Dodds, a country banker from Paducah, Ky. Mr. Dodds started with the RFC as an examiner 13 years ago and in late years has been a member of the RFC's Business Loans Review Committee.

Laurence Arnold in Commerce Post

In charge of the Commerce Department's Office of Small Business is Laurence F. Arnold who served the Smaller War Plants Corp. as director and as acting general manager. Mr. Arnold has had wide experience. Following his graduation from the University of Chicago, he spent 22 years in the wholesale hay and grain business in his native Newton, Ill. He served eight years in the Illinois state legislature and six years as a member of Congress from Illinois. Since 1932 he has been president of the Peoples State Bank of Newton.

Mr. Arnold will be appointed Assistant Secretary of Commerce for Small Business as soon as congressional action on the Bailey bill—which provides for three assistant secretaries of commerce—has been completed. The Bailey bill has been approved by the Senate and now is on the House calendar backed by a favorable report from the House Commerce Committee.

At present the Office of Small Business has a staff of about 125 people, while the staff of the RFC Small Business Division numbers 11. This number of people seems small compared with the 2500 on the Smaller War Plants Corp. payroll, until it is realized that these groups merely do a co-ordinating and supervisory job, and can draw upon any of the 12,000 employees of the Reconstruction Finance Corp. and the 27,000 comprising the Bureau of the Census, Office of International Trade, Office of Domestic Commerce, National Bureau of Standards, Civil Aeronautics Board and other staffs in Commerce.



CHAUNCEY Y. DODDS

Mr. Arnold and Mr. Dodds plan to set up programs under which the two offices will complement each other, and avoid overlapping and duplication of effort. Their goal is to knit the organizations together in such a way that small businessmen applying for advice or assistance at any of the field offices of the Department of Commerce, or the loan agencies and branch offices of the RFC, will be served quickly and effectively.

Theoretically the RFC Small Business Division should be preoccupied with the financial problems of small business. Actually, because proper solution of financial problems requires information and experience of many different types, the RFC service covers a wide range of subject matter. The RFC Small Business Division is ready to advise on such matters as managerial organization, responsibilities and problems of management, modernization of manufacturing facilities, organization of marketing effort, design of products and many other subjects vital to business—all in addition to plain banking and financing. The range of assistance available from the RFC is as broad as industry itself, since the RFC not only has several thousand engineers and technical men regularly on its payroll, but also enjoys the services of much outside talent on a per diem basis.

RFC spokesmen are careful to state, however, that they studiously refrain from entering competition with private industry. The RFC function is to supply information, advice and financial assistance, and all such work as installing cost accounting systems, improving and designing products, etc., is left to private firms.

Financial, Supply Questions Asked

Of some 20,000 inquiries from small business which were received by the RFC in one recent month, about 25 per cent called for assistance in meeting financial problems. The remaining 75 per cent of the inquiries called for information and asked for help in obtaining materials or in obtaining price relief from the OPA.

One of the important financial powers enjoyed by the Smaller War Plants Corp. no longer is in existence; that was the authority to book prime contracts from the war procurement agencies and farm them out to subcontractors. Only one comparable power now is held by the RFC; that is the authority to buy government-owned surplus property for resale to small business on terms acceptable to the small businessmen thus serviced.

In a recent letter to managers of RFC loan agencies throughout the country, Charles B. Henderson, RFC chairman, reminded them the purpose of the RFC Act "is to assist in maintaining and promoting the economic stability of the country and to encourage the employment of labor. If, as has so often been emphasized, small business is having difficulty in obtaining long-term credit from private sources, we must emphasize

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It is reported that . . . . . .

The Railroad Research Bureau of U. S. Steel Corporation has designed an all-welded steel coal car that eliminates 15% of dead weight.

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B. F. Goodrich announces a new "white carbon black" which will permit the making of white and colored tires.

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"Sinsteel G," developed by American Electro Metal Company, is a duplex metal made by impregnating porous, sintered steel with copper. Because of its copper content, it can be brazed.

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Lockheed Aircraft Corporation is testing its "Speedpak," a streamlined metal container that fastens to the underside of an airliner and holds four tons of cargo.

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Westinghouse has patents on a new fluorescent lamp that resembles an incandescent bulb and uses arsenic in place of mercury.

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Du Pont is developing a method of porcelain enameling aluminum.

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A 2-horsepower electric motor, weighing only fifteen pounds, is made by Electrical Engineering & Manufacturing Corporation.

Myles Plastics Corporation of New York claims to have methods and compounds by which small, simple plastic parts can be molded cold at rates of 25,000 per hour or better.

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Chestnut trees, the chief source of leather tanning agents, are threatened by blight, but Monsanto chemists are working on a synthetic tan to take its place.

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The new semi-automatic machines of General Tire and Rubber Company can turn out a tire every two minutes, which is about twice the usual output.

A vacuum-draft oil burning furnace that does not require the conventional type of chimney was shown by the Norge Division of Borg-Warner Corporation at the Oil Heat Exposition.

get ready with CONE for tomorrow

Cranberry Canners Inc. of Cape Cod will test a mechanical cranberry picker this fall. It is expected to increase the yield per acre and double the rate of harvesting.

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The United States Patent Office is sorting and evaluating 10 tons of Nazi patents brought here from Germany.

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Great deposits of bauxite have been located in Oregon, conveniently near the hydroelectric plants of the Pacific Northwest, by the Oregon State Department of Geology and Mineral Resources.

Another good TURN



for You

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31

term loans and, specifically, our bank loan insurance program, to assist small business."

Small business, Mr. Henderson continued, frequently needs assistance other than financial, "such as better advice and better tools." He called on the entire RFC organization to supply to small business special technical advisory services "such as (1) engineering assistance on a consulting advisory basis on the purchase and installation of machinery, etc., (2) cost accounting advice, and setting up of bookkeeping records, and (3) financial counselor advice."

By pointing out to small business firms the weak spots in their operations, "such as inefficiencies, lost motion, out-of-line production and other adverse circumstances," he said, the RFC could help much more constructively than by merely granting or arranging a loan or a line of credit.

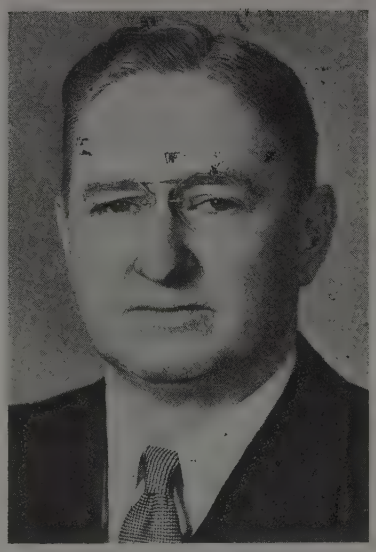
Mr. Dodds pointed out to STEEL that of all loans made by the RFC since its entry into the business loan field in 1932, 89.8 per cent have been to small business firms. As indicated by a sampling conducted by the RFC, 89.8 per cent of all the loans have been to companies having 9 to 83 employees.

Basically, according to Mr. Arnold, the Office of Small Business, Department of Commerce, is concerned with rendering assistance that will improve the small operator's chance for success. It is doing that by making available to him "proper counsel, business information, data on markets, materials, products, methods of operations, etc." The new office views its functions as falling into two types of service; 1—Immediate assistance with current problems, and 2—a long-range program to improve the operating and profit position of small business.

Seven Divisions Established

To take care of all needs, the Office of Small Business has set up seven operating divisions. These are concerned with: Business counseling, management service, technical service, area development, finance and tax service, competitive standards and "special services." This latter division is of special importance at present because it aims largely at helping small business firms solve their spot problems of obtaining materials and (while the OPA was alive) of obtaining approval of satisfactory ceiling prices.

The Office of Small Business has quite a few booklets which make helpful reading for prospective small businessmen. These tell what it takes to get into certain types of business, and stay solvent in them; the series covers grocery stores, service stations, metalworking shops and others.



LAURENCE F. ARNOLD

Of special interest is a new booklet which lists 100 questions which the prospective small businessman may ask himself. "They are intended to save a lot of time, effort and money," a spokesman told STEEL. "They are drawn up to show whether the prospective small businessman really is prepared to go into business. If he finds he cannot answer the questions satisfactorily, he just is not ready to strike out for himself."

That the new Office of Small Business will serve small business also by fighting for its interests on the government front is indicated by recent speeches by Alfred Schindler, under secretary of commerce. Mr. Schindler told a small business conference at Denver, Colo., June 28:

"A tax system must be established which will provide incentives and opportunity for more rapid growth and expansion in the field of small business. We must champion the cause of small business on every front, whether it be government regulation, legislation, or other factors, for only as we advance on all fronts can we reach our objective of maintaining a strong economy in this country."

The Office of Small Business, Commerce Department, and the RFC Small Business Division, are in constant contact with other government agencies having an interest in business in this country, and are encouraging a growth tendency to set up small business groups. The War Assets Administration, for example, has a Small Business Division charged with seeing to it that small business receives preferential treatment in the disposition of surplus government-owned property; this division is headed by Jack Frye, formerly with the Smaller War Plants Corp. in Cleveland. The Civilian Production Administration now is in process of organizing a Small Business Division whose duty it will be to make sure that small business firms receive the best possible treatment in the allocation of scarce materials.

Offers Market Guarantee

National Housing Agency is ready to receive requests for "Guaranteed Market" contracts. Its purpose is to encourage maximum production of new-type building materials and prefabricated homes by underwriting producers in the marketing of these products. This will be done through a contract between the producer and the Reconstruction Finance Corp. under which the government agrees to purchase at an agreed price any units of new materials or prefabricated houses which the producer is unable to sell through his own distribution channels.

Inquiries of prospective applicants for such contracts should be sent to "The Special Adviser on Financial Aids to Production, National Housing Agency, Fourth and Independence avenue S. W., Washington 25, D. C."

Under these contracts, according to National Housing Expediter Wilson A. Wyatt, production of new materials and new types of homes can get under way without the delays normally incident to the introduction of new materials and products. The guaranteed contract, said Mr. Wyatt, "while protecting the producer against any substantial risk of loss, at the same time provides him with a bankable document which will greatly facilitate his obtaining financing through traditional banking channels."

Black List Abolished

The State Department's black list of firms abroad accused of helping the Axis during World War II passed into history on July 8. The list was set up in July of 1941 with the names of some 1800 firms in Latin American countries who were denied the privilege of trading with the United States; they were charged with serving as propaganda outlets and espionage centers for Germany. Eventually the list contained names of 15,446 firms and individuals, not only in the Latin American countries but in neutral European countries. Abolition of the list was cited by the State Department as "an important step in the United States policy of freeing trade from wartime controls as soon as such action became possible."

Great Britain and Canada also abolished their black lists of individuals and firms on July 9.

Aldrich Pledges Aid in Reviving Foreign Trade

Head of President's committee plans greater participation by private groups in financing exports and imports

A THREE-POINT program for the revival of American foreign trade and investment and the return of such trade to private enterprise was outlined recently by Winthrop W. Aldrich, chairman of the Chase National Bank of New York, after a White House conference. Mr. Aldrich is head of Mr. Truman's Committee for Financing Foreign Trade.

The program, as briefed by Mr. Aldrich, is as follows:

"First, to bring into orderly common effort public and private finance, through business men and bankers, in the foreign field.

"Second, to foster the application of the productive capacity of the United States in the most effective manner possible to the needs of domestic consumption and foreign reconstruction.

"Third, to promote relations between American and foreign enterprises for the purpose of developing and maintaining foreign trade, both export and import, on a high and expanding level."

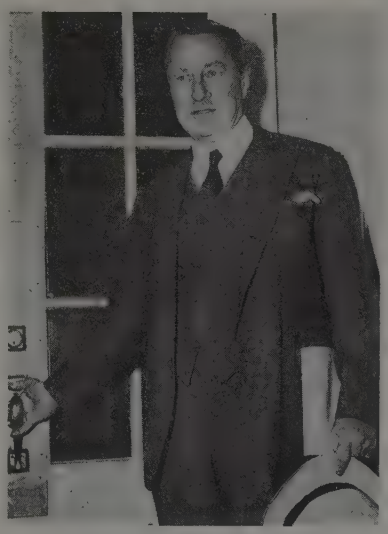
Mr. Aldrich declared he will "lose no time" in getting his committee to work on this program, which he believes will increase and stabilize employment in this country as well as aid world reconstruction.

Government Agencies To Help

"The conduct and financing of our foreign trade should be handled by private industry with the co-operation and such assistance as is necessary from the proper governmental agencies," Mr. Aldrich said.

"Government loans to other governments are necessary like many other things done in war or as the aftermath of war. They cannot be the continuing basis for international trade between free countries; they should be supplemented and eventually replaced by private international financing.

"The government has done and is doing, through the Export-Import Bank, its part in making the wheels of trade begin to move. The government has further subscribed to the International Bank and the international fund set up in the Bretton Woods agreement. It has in the Office of International Trade in the Department of Commerce, which is primarily concerned with foreign trade promotion, a specialized staff to study the effect of loans on the expansion of foreign trade and our domestic economy. That office already has pointed out that while there are less goods of many kinds than our own population demands, there are already some fields in which surplus capacity is looming up."



WINTHROP W. ALDRICH
Leaves White House after conference with President Truman on reviving American foreign trade

$650 Million Credit Is Extended to France

Export-Import Bank has announced the signing of an agreement extending a credit of $650 million to France. The credit is for reconstruction purposes and is on terms and conditions similar to other reconstruction credits of the Export-Import Bank. The credit is available up to June 30, 1948, bears an interest rate of 3 per cent annually and is repayable in 20 years in semiannual installments, beginning Jan. 1, 1952.

Major part of the credit, or approximately $470 million, is to be devoted to financing the purchase of American equipment. About $300 million will be used to pay for equipment orders already placed, including transportation equipment, agricultural implements, machine tools, electrical equipment, metallurgical and chemical orders. About $170 million will be used for orders for similar equipment. The remainder will be used to purchase industrial raw materials and to pay for United States services, including engineering charges, and ocean freight costs.

Revised Export Schedule Ready For Mailing

Methods of allocating and licensing certain commodities for shipment abroad are simplified. Paper work is reduced

COMPREHENSIVE Export Schedule No. 21, dated July 1, 1946, has been published and will be mailed soon to all subscribers by the Office of International Trade, Department of Commerce. Or. copies may be had at 25 cents each from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Most significant change in the new issue is a simplification of former methods of allocating and licensing certain commodities for export. It will mean a reduction of work incident to the preparation and submission of export license applications for the commodities involved, and also greater freedom in the distribution of export allocations.

Under the revision, general in-transit licenses now cover uniformly in-transit shipments to all destinations except Germany and Japan, but the number of "excepted commodities" which require individual license has been increased. Provisions of the general license have been extended to cover exportation of vessels to countries both in the K and E groups. Instructions for filling out the revised export license application (form IT 419 whose use became mandatory on May 15, 1946) have been revised and clarified.

By simplification of the limited distribution license procedure, exporters of numerous items such as hosiery, automobiles, trucks, tires, penicillin, etc., may be authorized under a single license, issued quarterly or monthly, to export these commodities to specified destinations in accordance with an improved distribution schedule. Thus the number of license applications has been reduced and the exporter is allowed greater freedom in distributing his allocation.

By quarterly issuance of a single license, the new procedure authorizes an exporter of building materials to export his entire allocation to any country or countries in Group K at any time during the validity of the license—usually one year from date of issuance.

Conditions under which special project licenses will be issued, amended or extended, have been made more stringent in view of the large number of commodities now under general license.

Nationalization Program Retarding British Steel Plant Modernization

Manufacturers, uncertain as to government's plan for taking over industry, reluctant to proceed with expansions and improvements until outlook is clarified. Industry views labor party's proposals with disfavor

By J. A. HORTON
British Correspondent, STEEL

BIRMINGHAM, ENG.

RECENT expressions of opinion on the British government's plan for nationalizing the steel industry show that manufacturers view the plan with considerable disfavor.

Following the debate in the House of Commons, when the government's decision to take into state ownership "appropriate sections" of the industry was passed by 338 votes to 184, the matter was debated in the House of Lords where Lord Dudley, one of the biggest owners of iron, steel and coal plants in the country, declared that the proposals stood condemned by all men of good sense and knowledge of the industry. He felt sure that the weight of advice given to the government was preponderantly against a scheme of nationalization and asked the government to produce the reports of its advisers.

Other criticism has come from steel producers and ship owners in addressing their shareholders at annual meetings. For example, Colvilles Ltd. had planned to remodel the melting shops at the Dalzell works at a cost of £2 million. This program had been held up through lack of government licenses, and when the company was informed that if new applications for licenses were submitted they would be granted, the whole subject had to be carefully reconsidered by the board owing to the delay and the coming changes in the industry. The uncertainty created by the nationalization proposals was regarded as likely to cripple the industry's power to benefit from the export demand. Nor was it evident how nationalization could reduce prices and thus help the consumer.

Sir James Lithgow, speaking as chairman of the big Scottish shipbuilding firm of William Beardmore & Co. Ltd. was equally emphatic in this condemnation. "The government," he said, "while professing interest in preparations for full employment, and particular anxiety as to the ability of the steel trade to play its part in such a program, refused over the last nine months to sanction any substantial schemes of modernization of iron and steel plants. Until the position is clarified your board has deferred all schemes of expenditure which are not immediately necessary to maintain the efficiency of our existing output and to keep faith with our customers. Our hopes have been completely damped by the decision to bring a large proportion of the steel industry into public ownership. The experience of the coal trade, from which all thought of private profit has already for some time been eliminated, seems already to have proved that a weak, impersonal control is too remote from the individual worker to enable the management to obtain from him the effort which he gives to an employer who is personally affected by the trading result."

Extent to which the British steel industry is carrying out its plans for reconstruction was described recently by Minister of Supply Wilmot when he told House of Commons that 27 programs cost-



COKING BATTERIES AT KUZNETSK: The large steel works at Kuznetsk in Siberia supplied a large portion of war materials for the Russian armies when eastern mills were overrun by the Germans. The plant now has been converted to manufacture of peacetime products. Shown here are the plant's coking batteries

ing nearly £16 million had been approved and licenses issued. A further 20 of the more urgent programs costing some £48 million had also been approved and the firms asked to supply the necessary details for the issue of licenses.

The last six months has seen beginning of the following major programs: Colvilles—new blast furnace at Clyde ironworks; Dorman Long & Co.—ore preparation plant; Guest Keen & Baldwins—preliminary work on site of new strip mill at Margam (extension of Cornelly quarry to supply limestone to new Margam works); John Lysaght—modernization of sheet mills at Newport; Richard Thomas Baldwins — electrolytic tinning plant at Ebbw Vale; John Summers & Sons—new melting shop; Stewarts & Lloyds—alterations to melting shop at Clydesdale, new tube plant at Mossend, reconstruction of tube plant at Coatbridge, new melting shop at Corby, extension to research department at Corbv and modernization of tube plant at Newport; United Steel Companies—modernization of boiler plant at Workington, new melting shop at Appleby-Frodingham, replacement of cogging and section mills at Appleby, Frodingham; Whitehead & Co.—improvements to re-rolling plant.

British steel production has been stepped up during the first five months of the year as much as possible considering the fuel and labor shortages. May figures show output at an annual rate of 13,619,000 tons of ingots, a figure higher than that achieved during the war years and comparing with 10,962,000 tons in the corresponding month of last year.

Production has been aided by increased availability of imported iron ore which usually contains about 55 per cent iron compared with 30 per cent for home ores. Use of this ore means higher output from blast furnaces in coastal areas which are designed for such material, and—a big advantage at the present time—there is a saving of coal through the lower coke consumption involved in smelting operations.

Consumers are finding it difficult to place fresh business. Particularly is this true in the sheet mills. Sheet rollers have recently had to face a decline in the supplies of semifinished which at best have not been large since the end of the war.

Higher freight charges face the British iron and steel industry. Costlier fuel is another factor looming large in the picture and the view is taken that a further upward revision in steel prices is inevitable.

With a world hungry for steel, price is a secondary consideration, as indeed it has been for many years, but it becomes one of first-rate importance when considering the possibilities of expansion of export business.

Fuel Shortage Limits Industrial Production in France and Belgium

Coal output gradually improving, but still is short of requirements. Volume is far below prewar levels. Prices are increasing. Rising cost of living causes unrest among workers. Passenger automobile production less than one-sixth of 1938 average

PARIS

INDUSTRIAL production in France is tending upward in many fields and output generally is limited by the amount of fuel available.

Output of coal in France has risen to 973,000 metric tons weekly. There are 215,000 miners working, of which 45,700 are war prisoners.

Imports of coal are also on the increase, and deliveries have begun to arrive from Poland. Imports of coal during May totaled 591,209 metric tons, coming from the following sources:

	Tons
Germany & Saar	295,358
Great Britain	68,194
United States	161,716
Belgium	46,483
Poland	9,453
Other countries	10,005

France's resources of coal per week on the present scale amount to 1,127,000 tons, which is slightly less than the tonnage required.

Thanks to the improved fuel situation, the output of iron and steel is tending upward. The following comparative figures for May, 1945, and May, 1946, indicate this, but show it is below 1938:

	May 1946	May 1945	Ave. Monthly 1938
	(in thousands of metric tons)		
Pig Iron	252	80	501
Steel Ingots, Castings	342	101	515
Rolled Products	242	54	334

Lack of furnace coke is the reason why output has not yet approached more closely to 1938 tonnages. Before the war, France received considerable quantities of coal and coke from the Ruhr basin in exchange for Moselle iron ore, and also from Belgium and the Saar. At present, neither the Saar, nor Belgium, nor even Holland can supply the required tonnages, and it is for this reason that France is asking for more coal from the Ruhr.

Among the major industries consuming steel, improvement is noted in the automobile industry. Following are output figures for May, 1946, compared with the average monthly output in 1938:

	May 1946	Ave. monthly 1938
	(number of vehicles)	
Private	2,330	15,200
Commercial	5,830	3,260

The firms of Renault, Citroen and Berliet manufacture almost entirely commercial vehicles for the French industry. Against this, the output of private automobiles is severely restricted; only a few units are for the home market, as the greater number is earmarked for export, and the French customer can only obtain a car when a permit has been delivered to him by the ministry of production, and these are not given freely. Official prices of automobiles are about five times the prices prevailing in 1939, and, in view of the scarcity of new cars, second-hand cars command prices which exceed the list prices of the new ones, by 100 per cent or more.

French steel prices are also tending to go upward. Present prices of a representative selection of products are as follows:

	French francs	Dollars
Rerolling Billets	3,580	$29.80
Shapes	4,499	37.50
Steel Bars	4,700	39.15
Sheets, under 2 mm.	7,012	58.43
Sheets, 2 to 4 mm.	6 353	52.95
Plates, 5 mm. & over	5,789	48.24

In Belgium, output is also gradually increasing. The number of blast furnaces in operation to date is 29, as against 46 in 1939. The average monthly production of pig iron is 146,300 metric tons, which compares with 255,600 tons in 1939. For rolled steel products, the figures are 128,700 tons and 183,500 tons respectively.

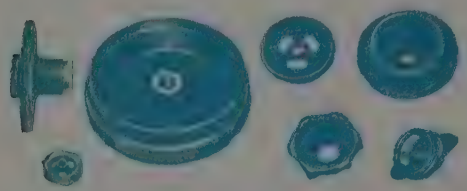
As from July 1, the price of Belgian coal has been raised to 450 Belgian francs per metric ton ($10.23).

In France as well as in Belgium, wages are again in the forefront, but for different reasons. In France the workers are organized under two trades unions, the Confederation Generale du Travail (C.G.T.) and the Confederation Francais du Travail Catholique (C.F.T.C.). The first has communistic tendencies and exerts a political influence, the second is a Christian organization and claims no political activities. While, after the devaluation of the franc in December, 1945, the various political parties had agreed to stabilize wages, the C.G.T. announced, two days before the elections of May, 1946, that they would only support a new government that would grant a 25 per cent increase of wages and take measures to prevent a rise in prices. It is to be noted that the cost of living in France is constantly increasing. Taking 100 as index for 1938, the index was 481 in January, 1946, and reached 547 in May.

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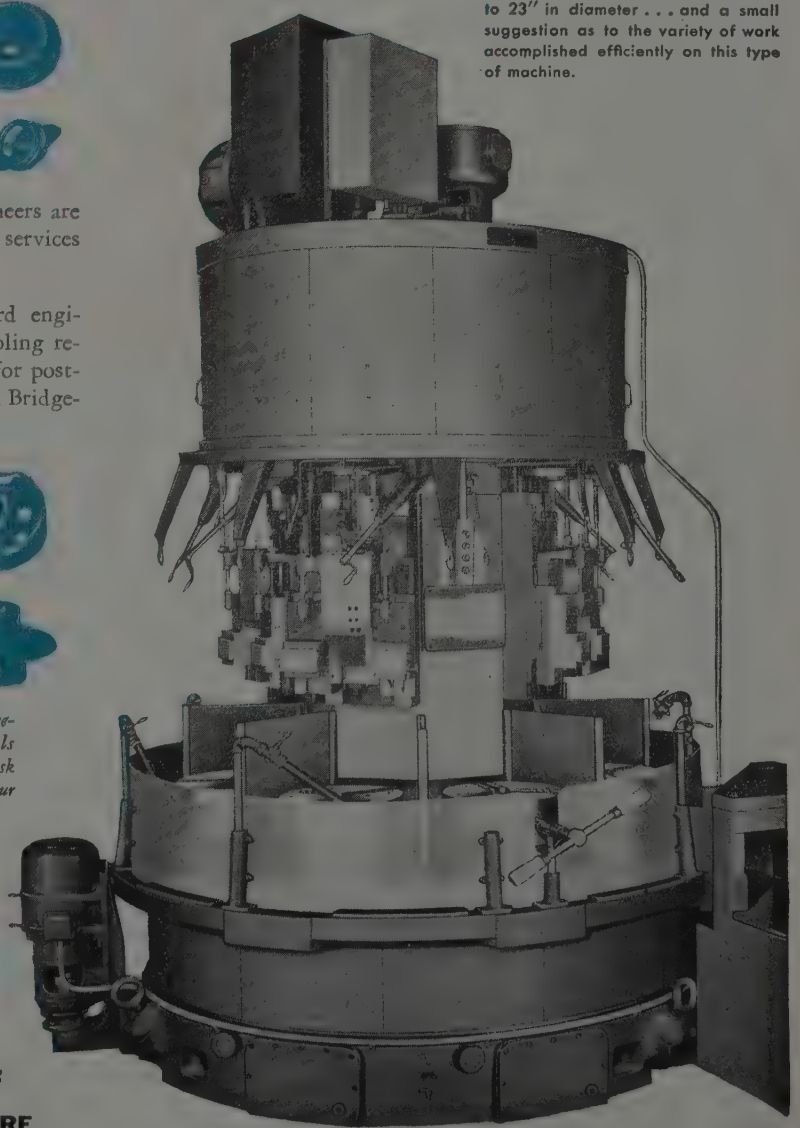
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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

No serious disruptions noted in industrial prices three weeks after controls are lifted. Automobile builders waiting to see what effect higher production will have on costs. Output of 75,000 to 80,000 units weekly expected

DETROIT

TERMINATION of price controls has brought no serious disruptions in the price structure of materials and manufactured goods, although it is still somewhat too early to ascertain what the ultimate course will be. Manufacturers generally are determined to hold present price levels even though current operations in many cases—automobiles for example—are well into the red ink. However, until some clear indication of overall costs can be gained there is little point in trying to adjust prices now. Passenger car builders, operating at one-third to one-half the levels of 1941, are waiting until assembly lines accelerate to somewhere near normal before taking another look at balance sheets. Packard points out, for example, that no consideration is being given to advancing prices provided contemplated production levels can be reached and if they can it may even be possible to lower prices from those now in effect.

Expect Materials Costs To Rise

Among the various basic raw materials, scrap iron and steel appear to be potentially in the greatest danger of advancing because supplies are so short, even though scrap dealers and brokers are almost unanimously against making any changes until the unsettlement attending the demise of OPA has had a chance to ease. A few nervous foundries reportedly have made offers of as much as $30 per ton for cast materials, about $10 a ton over the ceiling, but no instances of shipments moving at this level are heard. This kind of talk nevertheless has the effect on smaller scrap dealers of persuading them to hold onto tonnages they may have acquired.

Some of the larger fabricating plants reportedly have been approached by steel mills with a pretty sound argument for holding prices of production scrap at current figures. It goes something like this—if a fabricator generates, say, 10 tons of scrap for every 100 tons of steel he uses and decides to ask $1 a ton more for his scrap, his indicated net gain would be $10, but the higher price on scrap would have to be passed along to steel mill buyers and eventually be reflected in a higher price on steel. So, if the fabricator ultimately has to pay $1 per ton more for his steel, his cost per 100 tons purchased would increase $100 and would be offset only $10 for his higher scrap sales price, so his net loss would be $90, while higher material prices would be reflected in higher prices for end products and consequently a more restricted market and less production.

Car Production Gains

Car and truck production last week was scheduled for another slight hike from the new postwar high level established in the week ending July 13 which figured to be 65 per cent of the 1941 rate. It now seems likely that a total of 75,000 to 80,000 per week will be about the limit on the basis of present supply possibilities, in fact, the CPA in Washington is hinting a reduction in August because of the diversion of pig iron to farm equipment and housing programs. This may well be, but around Detroit no one seems to know for sure just what if any diversion is contemplated, and pig iron sources report their shipments to automotive plants and other foundries may improve in the next few weeks. As mentioned before, the scrap outlook is dark, but the War Assets Administration has tossed out a few encouraging morsels of optimism with the announcement that appreciable quantities of surplus machinery shortly will be scrapped and the material routed to established scrap channels. It would be well to keep fingers crossed on the latter eventuality.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January	121,861	524,073
February	83,841	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,321
June	214,511°	546,278
Week ended:		
June 29	66,913°	127,923
July 6	45,175°	96,457
July 13	72,995°	114,318
July 20	76,000°	109,912

°Preliminary

UAW Stages Rally

Last Tuesday, the "Political Action" experts of the UAW-CIO opened up their bags of tricks and staged public rallies in behalf of re-establishment of government price controls. Inflammatory leaflets were distributed throughout plants in this area and others were scattered about from an airplane, calling for all factory hands to stop work at 2 p.m. and march to a downtown gathering where demonstrations and addresses in favor of price control were scheduled. Leaders of the UAW instructed their locals that they were "authorized" to leave work for the demonstrations, even though permission might be refused by plant managements. The latter might have forestalled such usurpation of authority by simply pulling the switches from noon to 8 p.m., but instead made only half-hearted protests against the loss of production which the work stoppage involved. Union leaders promptly came back with retorts that no more loss of production was involved than that occasioned by the planning and execution of the recent Automotive Golden Jubilee—not a bad rejoinder at that.

Director of the Detroit rally was Richard T. Leonard, head of the Ford UAW local who is moving to a new level of importance in union administration. First countermeasure which union proposes to invoke should price controls not be restored is a nationwide buyers' strike. There is little chance of any organized buyers' action being successful, human nature being what it is. As long as people have money, and the stores stay open, business will go on. The only successful buyers' strike would be one springing from the voluntary decisions made by individual purchasers. Dictatorial efforts of the CIO might work in just the reverse direction.

May Make New Wage Demands

As a later threat, the UAW is making menacing gestures over the possibility of enforcing the reopening of wage demands upon automotive plants, even though present contracts, with Ford and General Motors at least, specifically defer any further wage negotiations until next spring. The Chrysler contract, however, may be reopened upon 60 days' notice, and the union appears to have instituted a campaign leading to such ne-

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TESTS TIRES, WHEELS: This dynamometer truck, adapted by Goodyear Tire & Rubber Co., Akron, from a 6-wheel drive Army truck, is used to test large tires and wheel equipment for off-the-road vehicles and machinery. The free rolling wheel below the cab is used to measure distance and speed during testing operations

gotiations. The approach is the familiar wildcat strike technique—a group walks out of this department protesting against the heat, and the entire plant is stymied, another handful of men leaves some other department claiming they are being victims of a "speedup," etc. Care is always taken to see that notices are furnished to all newspapers about each of these incidents which are forthwith given front-page positions in all the papers. Nothing could play better into the union's hands than this steady stream of publicity over incidents which in normal times would never be heard of outside the plant but which now appear to piece together in the pattern of an organized campaign to create false impressions of working conditions among the public.

Productivity Being Stressed

Actually, it seems doubtful there will be any major labor disturbances in automotive plants until production has pushed up to a point nearer peak levels. There is increasing realization of the importance of individual productivity in high union quarters, both William Green of the AFL and Lee Pressman of the CIO having made pronouncements on this score in recent weeks. Perhaps they are realizing that if unions can go to management with concrete examples of increased productivity they will have far more convincing arguments for higher wages than by merely repeating government statistics on advanced living costs, particularly when practically all manufacturers are operating at a loss. They have already seen that an arbitrary advance in wages, forced virtually at the point of a gun before any measure of productivity could be made, results only in higher prices which quickly eat up all the wage gain. They know this cannot be repeated indefinitely. If this reasoning is correct it is a heartening sign and could mean the absence of serious strikes for a lengthy period. Unfortunately, not many management observers here are inclined to the viewpoint, being resigned to a protracted wave of labor troubles.

An Analysis of the Situation

Frank Rising of the Automotive & Aviation Parts Manufacturers Inc. sums up the situation nicely in a recent memorandum: "The idea dies hard, with some people, that it is better to have someone in Washington decide for us all what we should get for our work and what we should pay for our goods, than to let us exercise our own ability to say yes or no. But the idea is dying. People are sick and tired of the mess that has been made by the propagandists who have passed themselves off as wise economic counsellors and arbiters. . . . It would be good to get back to a world of more sanity, more confidence. Reasonable and sober people have no fear about wild skyrocketing of prices—they know that what was true throughout our lives will be true again. The laws of supply and demand, in a free economy, do regulate prices. . . . The working man has been badly duped. He has been led to believe that the purchasing power of money-tokens was everything and that production of goods and services could be ignored — was hardly worth talking about. He was told that labor costs could mount rapidly without affecting prices. What a shameful, dirty business this has been. Now the working man is learning that there is a connection between cost and price. He has a right to be very angry at those who misled him. In many cases his anger will be misdirected, however, he will be told that "profiteers" are to blame for the mess. He has had enough of the something-for-nothing life to like it pretty well. He never learned that the subsidy money which hid the price rise was being taken out of his other pocket—may never learn it. It would not be at all surprising if he were pretty sullen."

K-F Revises Schedules

Three to four years of peak production, 4 to 5 million cars a year, is the latest estimate of the future to come from J. W. Frazer, president of Kaiser-Frazer Corp. He adds that all K-F dealers will have floor samples by Sept. 15, and deliveries to the public can start after that time. Production at Willow Run is as yet inconsequential, but revised schedules now call for assembly of 12,000 cars in October and 30,000 a month by the end of the year.

GM Offers Training Course

With the beginning of the school year this fall, General Motors Institute in Flint, Mich., will inaugurate a co-operative course in business administration at the college level for training young men as officer personnel and potential supervisors and executives for the various divisions of the corporation. It will be a four-year course, designed to provide sound training in business operations and management, for manufacturing industries with specific emphasis upon General Motors policies and methods.

Organize Research Institute

Meanwhile in Detroit the organization of the Wayne Engineering Research Institute has been announced. Characterized as a "science service for industry," the institute is a nonprofit undertaking, using the laboratories of Wayne University on a rental basis and with the university faculty acting as consultants and project engineers to augment the institute staff. Proposed programs are calculated to be of special benefit to smaller industries not equipped with research and development staffs. Initial outline of facilities covers the fields of aeronautical engineering, civil engineering, mechanical engineering, engineering mechanics, engineering shop work and drafting. L. M. Patrick, 448 Merrick, Detroit 2, is acting director of the new organization.

HYDRAULIC BALANCE

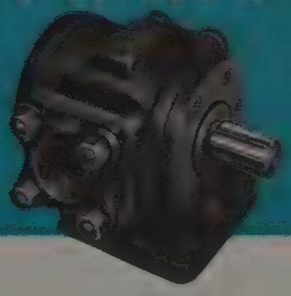
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And Means MUCH LONGER PUMP LIFE



Diagram showing patented "Hydraulic Balance" construction.

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As illustrated by the diagram above, equal and opposing pressure areas are provided on the outlet side and on the inlet side of Vickers Balanced Vane Type Pumps. The equal and opposing radial hydraulic thrust loads cancel each other . . . consequently there are *no* bearing loads resulting from pressure. The major cause for wear is thus completely eliminated and the result is much longer pump life. This "Hydraulic Balance" construction is exclusive with Vickers Vane Type Pumps; it also permits an unusual design compactness and is an important reason for the exceptionally high efficiency of these pumps.

Vickers Balanced Vane Type Pumps are available in single-stage for 1000 psi (see Bulletin 40-25a); two-stage for 2000 psi (see Bulletin 40-16) and also two-pressure, large-small volume (see Bulletin 38-14). Vickers Application Engineers will gladly discuss with you the many different types of hydraulic power and control circuits on which these pumps have improved machine performance. Write the office nearest you.

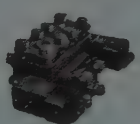
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Aircraft Firm Runs Own Air Freight Service

"Freighter" planes utilized by Piper Aircraft Corp. to keep critically-short supplies moving to its plant

TO KEEP more than 2500 different items moving into its Lock Haven, Pa., plant in sufficient quantities to maintain a production rate of nearly 45 airplanes per day, Piper Aircraft Corp. is operating its own air freight service using Piper Cub planes.

Two flying members of the purchasing department, known as flying expediters, shuttle back and forth between Cub Haven airport, next to the Piper plant, and suppliers' plants as far west as Chicago.

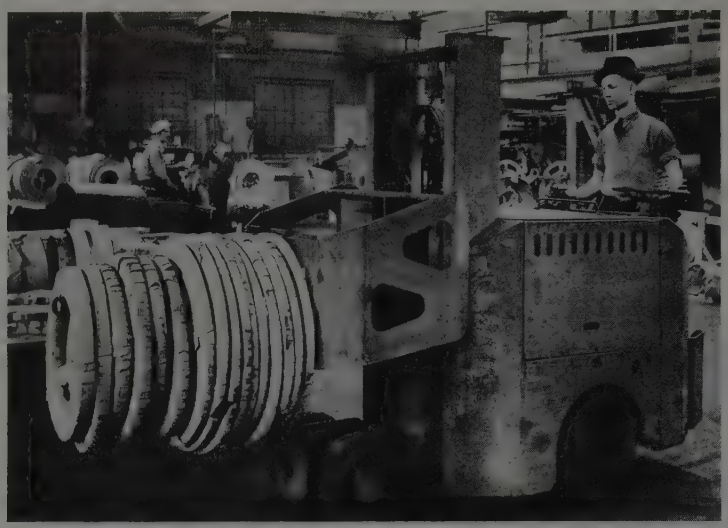
One of many examples was the case recently when production was faced with a complete shutdown because of lack of one size of small screw. A flying expediter brought in a 100-pound shipment of 100,000 screws the evening before the shortage would have forced curtailment of production. Cost of the aerial deliveries is negligible when figured against a loss of about $110,000 if production is shut down 2 days for lack of parts. The small "freighter" planes burn six gallons of gasoline an hour at 105 mph.

One afternoon recently 500 pounds of aluminum stock from Alcoa, Tenn., 100 tachometers from Chicago and 25 throttle assemblies from Kalamazoo, Mich., arrived in different airplanes. A typical shipment from Michigan can be made in four hours by air while the fastest surface transportation may take three to four days.

ASM Chapter Formed by Atomic Bomb Personnel

American Society for Metals has granted a charter to 37 metallurgists, physicists, engineers and technicians engaged in the atomic bomb project for the formation of the Los Alamos, N. M., chapter of the society. This is the 69th ASM chapter in the United States and Canada.

Los Alamos chapter officers include Frank Kubosch, chairman; Harvey L. Slatin, vice chairman; James M. Taub, secretary; and Harold H. Hirsch, treasurer. Trustees are Walter F. Arnold, Gerald Tenney, William W. Wellborn, Eric R. Jette and Rex Peters.



FACILITATES HANDLING: Battery-powered industrial truck moves wrapped coils of stainless steel strip, weighing 4000 pounds to shipping room in Sharon Steel Corp.'s plant. A fleet of electric trucks is used by the company for inter-plant transportation of materials and for loading and shipping

BRIEFS . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

International Harvester Co., Chicago, has bought the government-owned equipment located in the malleable iron foundry formerly owned by General Malleable Corp., Waukesha, Wis., for $550,000. The foundry was acquired early this year for $496,000.

—o—

Mineral Wool Insulations Co., Fontana, Calif., has been formed to manufacture insulation materials utilizing by-products from the Kaiser steel plant located there. Officers are: Harvey H. Head, president; Charles W. Hawthorne, vice president and chief engineer; Richard L. Gray, secretary; and C. T. Sauers, treasurer.

—o—

Talon Inc., Meadville, Pa., has acquired from War Assets Administration the plant formerly occupied by High Standard Mfg. Co. in Hamden, Conn., and will use the facility to expand production of slide fasteners.

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American Institute of Steel Construction Inc., New York, has opened a district office at 1617 Pennsylvania Blvd., Philadelphia 3.

—o—

H. K. Porter Co. Inc., Pittsburgh, has moved its Boston office from 38 Chauncy St. to 294 Washington St., Room 735, Boston 8.

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American Locomotive Co., New York, has announced that it has developed a method of building welded locomotive boilers at its Schenectady, N. Y., shops.

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Acme Supply Co. Inc., Los Angeles, has reconverted from war stocks and has available a 25,000-ton stock of bolts, nuts, washers, rivets and screws.

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Conlon Corp., Chicago, has contracted with Western Auto Supply Co. to manufacture household washers and ironers to Western Auto's specifications for the latter company's retail outlets.

—o—

Portabuilding Inc., El Paso, Tex., has been formed to design and sell steel and iron products and will specialize in fabrication of portable warehouses. Officers are: W. K. Ramsey, president; P. K. Holland, vice president; and Mrs. E. W. Ramsey, secretary-treasurer.

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Cooper-Bessemer Corp., Mt. Vernon, O., has developed a new railroad locomotive diesel engine which the company says develops from 40 to 50 per cent more horsepower than any other

engine with similar displacement made by the company.

—o—

Allison Division, General Motors Corp., Detroit, has established a new unit designated as the Allison Bearing Plant at Indianapolis. The plant will be devoted exclusively to development and production of bearings.

—o—

Vyncote Division, Watson - Standard Co., Pittsburgh, has expanded its facilities for production of vinyl plastic coatings and now has technical and production personnel and a separate building for this work.

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Kearney & Trecker Corp., Milwaukee, has opened district offices in Pittsburgh, Detroit, and Cleveland. Respective addresses are: 925 Frick Bldg.; 4363 Woodward Ave., Royal Oak; and 1426 B. F. Keith Bldg.

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Ohmite Laboratory of Armour Research Foundation, Illinois Institute of Technology, Chicago, was dedicated recently to provide precision electrical measurements.

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Douglas Aircraft Co. Inc., Santa Monica, Calif., has selected Aircraft Mechanics Inc., Colorado Springs, Colo., as the prime manufacturing source for Douglas-designed servicing equipment.

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Monsanto Chemical Co., St. Louis, has leased the government-owned chemical warfare service plant at Monsanto, Ill., and will spend approximately $1 million on alterations and additions.

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Chemical Department, Pittsfield, Mass., General Electric Co., has expanded with the formation of a metallurgy division which will handle the sale of various types of permanent magnets and metallurgical products.

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Columbia Axle Co., Cleveland, will begin production soon of overdrive axles for Ford and Mercury cars.

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Niagara Machine & Tool Works, Buffalo, has begun an expansion program costing more than $500,000, which will increase the company's capacity to produce weldments and other products.

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Stacey Dresser Engineering, Cleveland, division of Stacey Bros. Gas Construction Co., Cincinnati, has been awarded a contract by Southern Gas & Electric Corp., Sarasota, Fla., for design and installation of a propane-air gas plant.

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Edgar Allen & Co. Ltd., Sheffield, Eng., has received a contract totaling £420,000 for construction of two cement plants in China.

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Carboloy Co. Inc., Detroit, has appointed Carey-McFall Co., Philadelphia, as distributor for its products.

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Food Machinery Corp., San Jose, Calif., has been awarded a Navy contract for development work on the Water Buffalo amphibious tank.

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American Standard Association, New York, has published its 1945-46 *Year Book* which may be obtained free of charge from the association.

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Airco Export Corp., New York, has opened a permanent products exhibit at its main office.

Westinghouse Gets Single Order for 244 Elevators

Westinghouse Electric Corp., Pittsburgh, has been awarded a contract for what is believed to be the largest number of elevators ever ordered—244 high speed elevators, to be built and installed at a cost of $3 million. The elevators will be used in three housing developments being erected in Manhattan by Metropolitan Life Insurance Co.

The elevators will have all-steel cabs with hard enamel finishes and will be automatically operated; they will be manufactured at Westinghouse's Jersey City, N. J., plant.

Lukens Reports Quarterly Net Earnings of $171,297

A consolidated net profit of $171,297 was shown by Lukens Steel Co. and subsidiaries, Coatesville, Pa., in their fiscal year's third quarter ended June 15, but for the first three quarters of the fiscal year they sustained a consolidated net loss of $1,455,188, before estimated tax recoveries under carry-back provisions of the Internal Revenue Code. Of the loss for the three quarters, $1,107,044 was the result of reduced operations during the steel, coal, and railroad strikes. Strike costs and other shutdown expenses in the third quarter were $127,881.

World Mineral Conference Postponed to Mar. 17, 1947

Plans for the World Conference on Mineral Resources which was to have been held at the Waldorf-Astoria in New York, Sept. 16-18 have been changed because of difficulty in obtaining hotel reservations for the participants. The conference, sponsored by the American Institute of Mining & Metallurgical Engineers, has been postponed until Mar. 17, 1947. It will be held in the Waldorf-Astoria from Mar. 17 to 19.



STARTS NEW PLANT: As Robins Conveyors Inc. celebrated its 50th anniversary by announcing construction of a new manufacturing building at the Passaic, N. J., plant, Thomas Robins, founder of the company, turns the first spade of earth

Fabricating Curbed by Steel Pinch

San Francisco area consumers report difficulty in obtaining supplies of virtually all products. Eastern steelmakers reported withdrawn from district. Local production inadequate to match demands

SAN FRANCISCO

SHORTAGES of finished steel products are becoming increasingly acute in the San Francisco area, and, in fact, all along the West Coast. Moreover there is little indication that the dearth of materials will ease soon.

Virtually no products are in sufficient supply to meet demand, but the scarcity is greatest in sheets, light plates and all wire products including nails. Nails and sheets, for which probably the largest demand exists, are in shortest supply.

This situation has resulted in a general slowing down of fabricators' operations, and it is believed that some plant suspensions may occur should the shortages continue long. Construction is being stymied in many areas because of inability to get nails, and farmers are hard put for wire.

Principal cause of the scarcity, steel suppliers here say, is withdrawal from the West Coast market of all eastern steel mills, leaving the western area dependent on its own production. Although the West Coast's ingot capacity now is sufficiently large to supply a large portion of the coast's primary steel needs, rolling mill facilities and other finishing equipment are far from adequate to give the coast independence in many products. That is particularly true of wire products and sheets.

Ingot Capacity Not Fully Utilized

In addition, of course, ingot capacity is not being utilized fully because of the shiftover of the Geneva mill from government to private operation. Geneva expects to resume steelmaking July 22, when a part of the open hearth department will be brought into production. The slabbing mill will begin producing shortly thereafter and the finishing mills will start turning out plates sometimes in August. Barring delays in recruiting manpower, it is believed that Geneva will be shipping in quantity in September.

Steel observers here believe that there will be no effective break in the supply bottleneck until late 1947, when Columbia Steel Co.'s new rolling mills are put in operation. Expansion of Bethlehem's West Coast facilities probably will be completed by that time as well.

Meantime, prices on steel products continue to hold steady in the San Francisco area. There have been no upward changes either as a result of the recent increase in rail rates or because of the ending of OPA. Warehousemen here have adopted a "wait and see" attitude on OPA. The rail rate increases were labeled as "interim" by the ICC, and it is unlikely that any price revisions will be made until a permanent schedule of higher rail rates is instituted.

The magnesium plant operated by Permanente Metal Corp. (Henry J. Kaiser interests) during the war at Manteca, Calif., has been declared surplus by War Assets Administration and has been put up for sale or lease.

The plant was built at a cost of $6,230,000 to the government.

The Manteca plant was designed to produce 10,800 tons of magnesium annually. Machinery and equipment include all items necessary for reducing pellets of magnesium crystals and casting and molding ingots. There are six principal and 11 smaller buildings on the 26-acre site.

Eight districts of ninth region Civilian Production Administration report approval of 132 applications for $2,536,209 of public and commercial non-housing construction in the week ended July 4. During the same period, 125 applications for $4,505,948 of building were denied. The ninth district includes the offices reported by San Francisco, Portland, Seattle,



Reno, Spokane, Wash., Boise, Idaho, Casper, Wyo., and Honolulu, Hawaii.

In the preceding week there were 158 approvals for $3,035,880 and 143 denials for $3,201,234.

Joshua Hendy Iron Works, San Francisco, has been awarded a $516,632 contract by the Interior Department for furnishing fourteen 96-inch outlet gates and hoists for Shasta Dam in California.

Industry Price Line Holds In Pacific Northwest

SEATTLE

In the face of rising costs, shortages of material and other handicaps the steel industry in this area is making every effort to keep price levels in hand.

The Washington Metal Trades Inc. has asked fabricators to continue their normal price policy and to refrain from increasing costs despite the end of government controls. In a resolution it is recognized that many items are in short supply "but this is no justification for unreasonable price increases."



Geneva Steel, largest war-created steel facility, has been transferred from government to private ownership and now is producing for the United States Steel Corp. At left is a recent view of the plant near Provo, Utah

Petroleum Equipment Needs Rise As California Oil Industry Grows

Rapid expansion of oil producing facilities pointed to as indicative of area's expanding economy. New plant construction reported at $95 million in Los Angeles this year. Auto assembly plants gearing up for full output

LOS ANGELES

STANDARD Oil Co. last week announced a plant expansion at its oil cracking installation at El Segundo, near Los Angeles, to cost $2,250,000.

This is a typical pace-setter for the rapidly growing oil industry in southern California. The future of petroleum and with it the petroleum equipment field, appears brighter than at any period in history.

According to James Bone, chief, Los Angeles Chamber of Commerce industrial department, demand for oil products has held at high levels throughout reconversion. There is an overall picture of rising prices, rising volume and lower depreciation rates.

All this, Mr. Bone said, is certain to push the industry to production and sales peaks next year that will surpass former highs by considerable margins.

Quoting estimates supplied by the economics department of Standard Oil Co., New Jersey, Mr. Bone said civilian aviation gasoline use in 1950 will be almost three times that in 1946; civilian consumption is expected to be 23 per cent higher then than in the current year; lubricating oil, 19 per cent; asphalt, 35 per cent, and miscellaneous products about 15 per cent.

"Petroleum is part and parcel of southern California's basic industrial economy," Mr. Bone declared. Here then is one definite indication that forecasts of $100 million in all forms of new plant construction by the end of this year are not being exaggerated.

"Already, all new plant construction has reached $95 million in Los Angeles this year. For the whole of 1945 the figure was $83 million."

An industrial and utilitarian concomitant of oil, namely automobiles, also was cited by Mr. Bone as having important roles in the current burgeoning of southern California industry.

By the first of next year, he pointed out, the four major assembly plants now gearing up for full operation—Kaiser-Frazer, Ford, Nash and Chevrolet—will be working to capacity, according to reliable local sources.

Rate experts for all major western railroads were meeting last week in Seattle at a conference called to discuss a plan to lower freight rates on finished steel from the Geneva mill to West Coast ports.

While no definite indication as to the amount of the reduction has been made public, unofficial sources in Los Angeles are predicting the drop will be somewhere in the neighborhood of $4 per ton.

The Merchants & Manufacturers Association in Los Angeles is advertising for both skilled and unskilled workers to fill jobs long abegging in many factories here.

Off-the-record comment by association officials indicated that there is small hope for wholesale job acceptance until fall when many unskilled workers will come to the end of current periods for collecting state unemployment compensation.

Compensation Inefficiency Attacked by Industrialist

Alvin E. Hewitt, executive vice president, California Manufacturers Association, last week issued the first of a series of letters condemning inefficiency of the USES, which he charges has wasted millions in taxpayers' money by encouraging industrial unemployment.

The letter was addressed to Raymond Krah, USES director in Southern California Employment Stabilization Commission.

Mr. Hewitt charged that compensation payments are being conducted as a "petty racket" and that thousands of persons besides those for whom intended are receiving payments; that the compensation fund has been operated at an unnecessary deficit during the greater part of this year."

The industrialist declared the per capita cost of California state taxes alone is nearly double that of similar taxes in other industrial states, with the result that California-manufactured goods find price competition difficult.

He attributed this principally to inefficient administration of government operations, "empire building" by job-hungry bureaucrats and the "political practice of legislating bankruptcy."

Men of Industry



CARL W. HUFLAGE



NEIL A. BENSON



O. HAMMER

Carl W. Huflage, recently released from the Navy, has returned to the Reynolds Metals Co., Richmond, Va., as manager of converter sales, Foil Division. He joined Reynolds in 1926. At the time he entered the Navy, he was manager of the Southern Sales Division. **Charles Tichy**, plant manager of the Reynolds Louisville extrusion plant, will take charge of the Phoenix, Ariz., extrusion plant leased by the company from the government on a five year contract. **William F. Hunt,** who has served under Mr. Tichy as chief engineer of the Louisville extrusion operations, will occupy the same position in Phoenix. Extrusion operations in Louisville will be handled by **Harry D. Bittner,** formerly assistant plant manager, who will assume the title and responsibilities previously held by Mr. Tichy.

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Leslie B. Worthington has been elected president, United States Steel Supply Co., Chicago, subsidiary of United States Steel Corp. Mr. Worthington, formerly sales vice president of the company, succeeds **Ernest E. Aldous,** who has retired after 45 years of service with U. S. Steel subsidiaries. Mr. Worthington began his career with U. S. Steel subsidiaries in 1923, and was elected vice president of the supply company in 1942. Mr. Aldous had been elected president in 1942.

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Roland S. Higgins, recently released from the Army, has been appointed sales representative and head of the Detroit branch office, Hydropress Inc., New York.

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B. L. Cruzan has been named manager of the newly designated Allison Bearing plant, established by the Allison Division of General Motors Corp., Detroit. Mr. Cruzan has been a member of the Allison organization since 1918. **E. G. Davis,** with the company since 1935, will have charge of bearing production and development. **P. G. Martich,** formerly bearing sales engineer with the firm, will have charge of sales.

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Neil A. Benson has been appointed plant manager of the Will-Burt Co.'s plant No. 1, Orrville, O., recently acquired by the Hagan Corp., Pittsburgh, as manufacturing source for all its control devices. During the first two years of the war, Mr. Benson was works manager, Elliott Co., Jeannette, Pa. He then went to General Industries Co., Elyria, O., as assistant to the vice president in charge of manufacturing.

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Electric Metal Makers Guild Inc. has elected the following officers for the coming year: President, **J. E. Arthur,** superintendent of melting, Park Works, Pittsburgh, Crucible Steel Co. of America, New York; vice president, **R. H. Frank,** superintendent of melting, Bonney Floyd Co., Columbus, O.; and secretary-treasurer, **D. L. Clark,** superintendent of melting, Lockport, N. Y., steel mill, Simonds Saw & Steel Co. Fitchburg, Mass.

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Norman H. Shipley has been appointed district manager, Madison, Ill., plant, American Car & Foundry Co., New York. He joined the company in 1912, and had been assistant district manager at Madison since March, 1941.

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Dr. W. A. Archibald has been appointed head of the refractories section, chemistry department, British Iron & Steel Research Association. Dr. Archibald had previously carried out research on steel slag refractories problems at the Royal Technical College, Glasgow. During the last seven years he was with General Refractories Ltd., Glasgow.

—o—

W. E. Sievers, former president, has been elected chairman of the board, and **O. Hammer,** president and general manager, Security Engineering Co. Inc., Whittier, Calif. Mr. Hammer has been associated with the company since its inception in 1931.

—o—

George B. Proud, treasurer since 1941, Western Electric Co., New York, will retire Oct. 31, following 37 years of service with the company. H. Hastings Reddall, chief auditor of the company, has been elected to succeed Mr. Proud as treasurer on Nov. 1.

—o—

Frank Brockenridge has been appointed vice president and chief engineer, Automatic Washer Co., Newton, Iowa. He had been with International Telephone & Telegraph Corp., Newark N. J.

—o—

Walton T. Woods Jr., recently released from the Navy, has been appointed representative in Atlanta, Curtis Lighting Inc., Chicago. The Atlanta territory includes Georgia, South Carolina, and parts of Florida and Alabama.

—o—

James McComb, C. P. Corrigan and **R. P. McClave** have been appointed to the sales staff, Ramapo Ajax Division, American Brake Shoe Co., New York. All three have recently been released from the service. Mr. McComb has been appointed sales representative of the Ramapo Ajax Division at East St. Louis, Ill. Mr. Corrigan, who has been appointed sales representative for the Chi-



SILICON BRONZE BOLTS

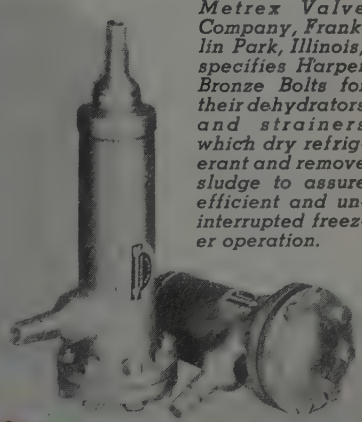
Vital to *Refrigeration*



COURTESY THE CREAMERY PACKAGE MFG. CO., CHICAGO

Thousands of carloads of perishable foods for home consumption—and for our good neighbor shipments abroad—require constant refrigeration to prevent spoilage and waste. The brunt of this refrigeration is borne by the sturdy freeze units made up of many components working in acid and moisture laden environment highly corrosive to common steel. Metrex dehydrators and strainers, and many other such parts depend upon the high tensile strength and acid and corrosion resistant properties of Silicon Bronze Bolts which can be easily removed for servicing and reused indefinitely.

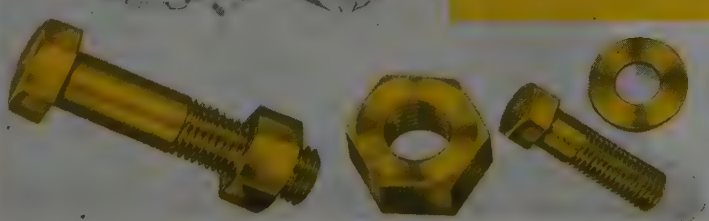
A wide variety of fastenings made from Brass, Naval Bronze, Silicon Bronze, Monel and Stainless are available for prompt shipment from large Harper Stocks. Harper's Special Engineering facilities serve the Refrigeration Industry constantly.



Metrex Valve Company, Franklin Park, Illinois, specifies Harper Bronze Bolts for their dehydrators and strainers which dry refrigerant and remove sludge to assure efficient and uninterrupted freezer operation.

The H. M. HARPER Company • 2646 Fletcher Street, Chicago 18, Ill.

Branch Offices: New York City, Philadelphia, Los Angeles, Milwaukee, Cincinnati, Dallas
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HARPER *Chicago*

cago and Cleveland districts, was with the sales department of the division when he entered the armed forces, having joined the company in 1939. Mr. McClave, who joined the division in 1936, has returned as a member of the sales staff of the Los Angeles department.

—o—

James K. Richardson has been named manager, Utah Metal Mine Operators Association, succeeding **A. G. Mackenzie** who has been elected vice president.

—o—

Frank J. Fay, sales manager, Anderson-Barngrover Division, Food Machinery Corp., San Jose, Calif., has been sent to Europe to survey food processing conditions and offer technical suggestions for increasing processing of staple foods. **Ralph W. Cook** has been elected sales manager of the corporation's Bean-Cutler Division.

—o—

Ed G. Doran has been appointed representative in Chicago and northern Illinois, Michigan Broach Co., Detroit.

—o—

William D. Reed, vice president, Sawhill Mfg. Co., Sharon, Pa., has been elected president of the National Association of Pipe Nipple Manufacturers Inc.

—o—

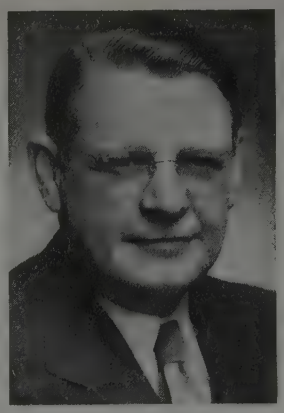
Justin J. Wetzler, chief engineer, Barnes & Reinecke, Chicago, designers and engineers, has been named to the newly created post of director of engineering. **J. Harvey Chandler,** formerly in charge of research and development of engineered products, Ekco Products Co., Chicago, succeeds Mr. Wetzler as chief engineer.

—o—

Recently elected officers of Safety Research Institute Inc., New York, are as follows: President, **Brahna Chalefman Hutchins;** vice presidents, **Frank Arnoldi** and **Robert Nathans;** and secretary and treasurer, **Angela B. Daniels.** Mrs. Hutchins had been vice president of the organization. Mr. Arnoldi was re-elected, and Miss Daniels had been secretary. The four officers were elected directors, too.

—o—

James A. Roemer has been named president, Niles Rolling Mill, Niles, O., a division of Sharon Steel Corp., Sharon, Pa. **Henry A. Roemer,** father of Mr. James Roemer, has resigned as chairman of the Rolling Mill board, in order to devote his time to his duties as president of Sharon Steel Corp. He has been succeeded by **Homer Butts,** operating vice president of Sharon Steel, who was president of Niles Rolling Mill. Other appointments announced for Niles Rolling Mill are as follows: **A. C. Davidson,** former assistant treasurer and auditor, becomes secretary and treasurer; **James E. Brady,** former works accountant, now auditor; **William J. Roemer,** former traffic manager and sales representative, becomes assistant general manager of sales; and **Paul K. Rader,** traffic manager and sales representative.



NORMAN A. PURDY

—o—

Norman A. Purdy, former superintendent, Tank Arsenal Division, Chrysler Corp., Detroit, has been placed on the general manager's staff in charge of the company's automobile quality inspection department. This activity was temporarily discontinued during the war, but has been re-established.

—o—

William G. Conley Jr. has been appointed manager, Kitchen Sales Division, Edison General Electric Appliance Co. Inc., Chicago. Mr. Conley, recently released from the Army, had been sales manager, counter equipment group, Electric Commercial Cooking Equipment Division of the company.

—o—

George T. Jahnke has been appointed director of advertising, Liquid Carbonic Corp., Chicago. He will have responsibility for, and control of, all customer and public relations for the corporation. Mr. Jahnke was in charge of the company's advertising from 1919 until shortly after the outbreak of World War II. Then he organized a division to expedite materials and parts for war contracts and headed that department for more than three years. In March of 1944 he resumed his advertising duties.

—o—

R. J. Weber, manager, Central Station & Transportation Sales Divisions, Westinghouse Electric Corp., Pittsburgh, has been presented the Order of Merit, highest award granted employees of the corporation for outstanding contributions to the electrical industry. Mr. Weber has been with the organization since 1910. **Jordan K. Silver** has been appointed manager, New Haven, Conn., branch, Westinghouse Electric Supply Co., New York, succeeding **Henry E. Mitchell,** who will continue as special representative. Mr. Silver joined the Supply company in 1919. **C. C. Smith** has been appointed special headquarters electronics sales representative, assigned to the Westinghouse southeastern district, with offices in Atlanta. His territory will include all of North and South Carolina, Georgia, Florida, Alabama and portions of Tennessee, Mississippi and Louisiana. Mr. Smith joined Westinghouse in 1936. **Julia Senko, Julius Miklowitz** and **Dennis Turner,** research scientists with the Westinghouse corporation's laboratories staff, have been awarded Westinghouse Research Laboratories scholarships for a year of post graduate study. The awards grant $1000, and each recipient may choose his own university.

—o—

Orville O. Kenworthy, recently released from the Army, has been appointed to the staff of the Color Division, Ferro Enamel Corp., Cleveland. He will engage in research and development work in his new position. His efforts will be devoted largely to the development of inorganic coloring materials for glass, pottery and plastics.

—o—

C. R. Hook Jr. has been appointed assistant to president for personnel, Chesapeake & Ohio, Pere Marquette and Nickel Plate railroads. He had been assistant to the general manager, Rustless Iron & Steel Division, Baltimore, American Rolling Mill Co., Middletown, O.

—o—

Derward Smith, general accountant, Tennessee Coal, Iron & Railroad Co., Birmingham, has been made assistant comptroller of the company. Mr. Smith joined the organization in 1944, having come from the Airplane Division, Buffalo, Curtiss-Wright Corp.

—o—

John D. Small, administrator of Civilian Production Administration, has announced the appointment of **Laurence F. Arnold** as his deputy for small business in CPA. Mr. Arnold, who is director of the Office of Small Business, Department of Commerce, will act as an adviser to Mr. Small and assist in formulating CPA's policies in behalf of small business. He will continue in his position with the Commerce Department. **James E. Fitzgerald** has become associated with CPA in charge of warehousing. He was with the old War Production Board, but had returned to American Steel & Wire Co., Cleveland, until his recent appointment.

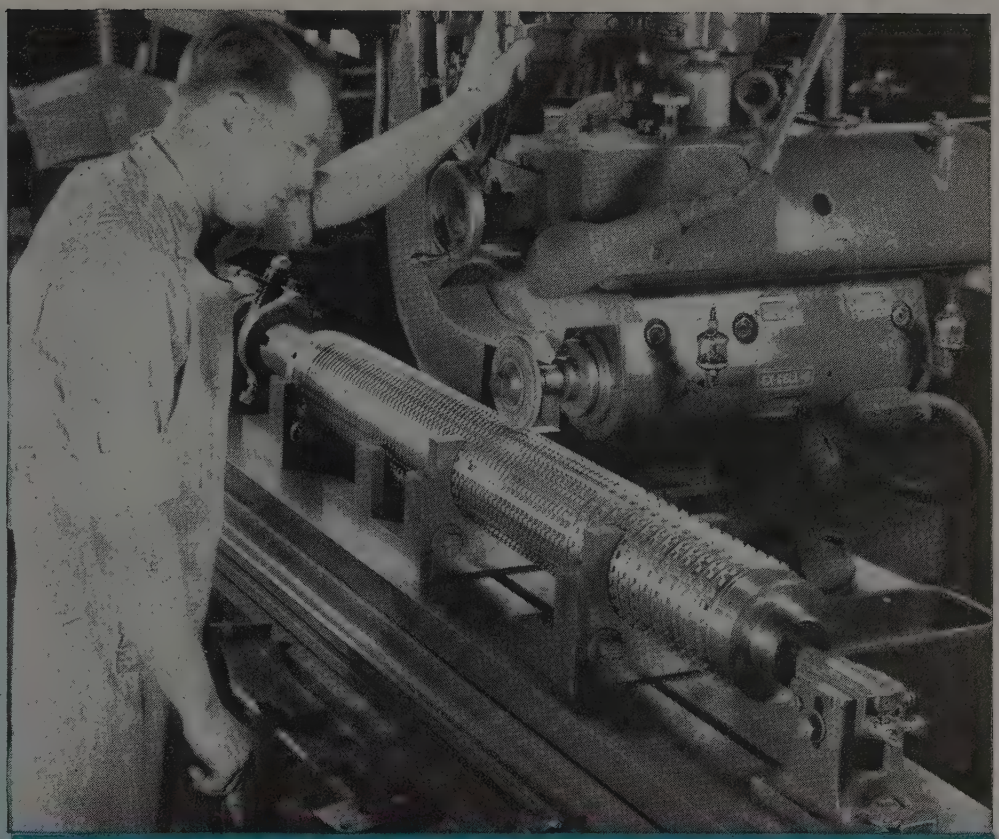
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Four recent appointments have been announced by the War Assets Adminis-

CTW
CONTINENTAL TOOL WORKS
EX-CELL-O CORPORATION

Continental
CUTTING TOOLS

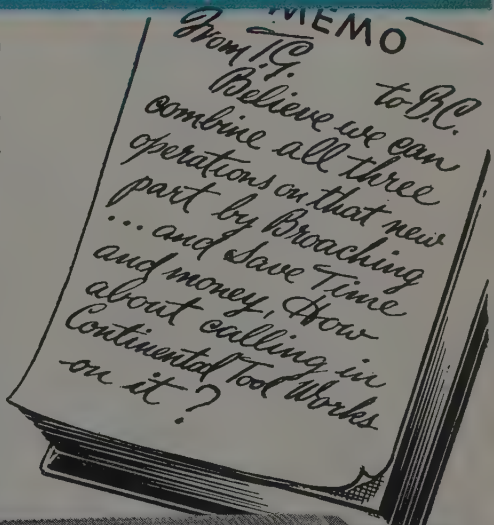
- Boring Bars and Tools
- Broaches
  Broach Pullers
  Broaching Fixtures
- Core Drills
- Counterbores and Countersinks
- CTW Drive Holders
- Counterbores (Tool Room Sets)
- Counterbore Pilots
- Inserted Blade Cutters
- Carbide Tipped Cutters
- Form Relieved Cutters
- Milling Cutters
- Thread Milling Cutters
- End Mills
- Side Mills
- High Speed Steel Reamers
- Carbide Tipped Reamers
- Shell Reamers
- Inverted Spotfacers
- High Speed Steel Tool Bits
- Carbide Tipped Tool Bits
- Circular Form Tools
- Cut-off Tools
- Flat Form Tools
- Dovetail Form Tools

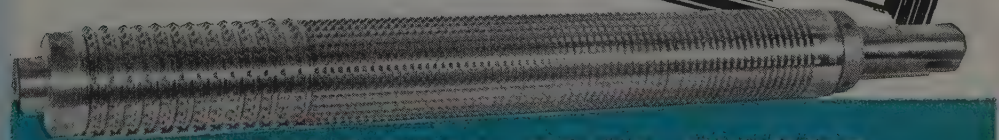


CONTINENTAL BROACHES

Precision Ground by Experts

Continental Tool Works, for 26 years a main source of fine cutting tools, is a pioneer in the field of broaching. The wide experience of Continental engineers assures you that each broach is exactly fitted, in design and workmanship, for the job it is intended to do. Every Continental broach is ground to exceptionally close tolerances by a skilled broach-maker. Continental makes a complete range of internal and external (surface) broaches, broach fixtures, holders and pullers, all to the same high standards. Get in touch with Continental today.





CONTINENTAL TOOL WORKS
DIVISION OF EX-CELL-O CORPORATION
DETROIT 6, MICHIGAN

tration. **Brig. Gen. Don G. Shingler,** chief of the International Division of Lend-Lease during the war, has been appointed deputy administrator, Office of Administrative Services, to succeed **Col. George E. Monson,** recalled recently by the Marine Corps for overseas duty. **Commodore Robert F. Batchelder,** former chief of the Navy's Property Disposition Branch, has been named deputy administrator for acquisitions. **Maj. Gen. Norman D. Cota,** formerly commanding general, 28th Infantry Division, will serve on the Board of Contractor Selection. **Maj. Gen. Richard Donovan,** formerly commanding general, 8th Service Command, is assistant to the administrator in coordinating surplus property disposal activities in southwestern United States.

—o—

Stanley S. Furst has been appointed general sales manager, and **James P. Raugh,** general works manager, General Refractories Co., Philadelphia. Both Mr. Furst and Mr. Raugh joined the company 18 years ago, and both recently returned from duty with the armed services.

—o—

M. C. Ness has been appointed assistant general purchasing agent, American Chain & Cable Co. Inc., Bridgeport, Conn. Mr. Ness has been with the company 26 years, and was purchasing agent for the York, Pa., plants. **W. E. Speck,** who has been in the York purchase department, has been appointed purchasing agent for the plants in that city.

—o—

John L. Crum has been appointed district representative of the new Colorado district, Luria Brothers & Co. Inc., Reading, Pa. His headquarters are in Pueblo, Colo. Mr. Crum was assistant purchasing agent, Colorado Fuel & Iron Corp., Denver.

—o—

Reorganization of the executive staff of Moore Corp., Joliet, Ill., has been announced by Conlon Corp., Chicago, which bought the Moore concern several months ago. The Moore staff as now constituted includes **Harry T. Worthington,** vice president and general manager; **John M. Foxx,** vice president in charge of sales; and **Orville E. Oesterle,** general factory superintendent. **W. A. Stuckey** continues as chief engineer, and **F. E. Wright,** in his 41st year with Moore, as secretary. The concerns will operate as separate units, Conlon continuing under **I. N. Merritt** as vice president and general manager. **Bernard J. Hank,** head of Conlon, becomes president of Moore and continues as its chairman of the board and treasurer.

—o—

Donald L. Hadley, Carleton B. Ryder and **Nicholas F. Pederson** have resigned from their previous positions and formed the firm of Hadley, Ryder & Pederson, design consultants, soon to open offices in Hartford, Conn. Mr. Hadley was design consultant, Westinghouse Electric Corp., Pittsburgh; Mr. Ryder, co-ordinator of apparatus design, General Electric Co., Schenectady, N. Y.; and Mr. Pederson technical supervisor with GE.

—o—

Edward C. Bayerlein, chairman of the board of directors, Nordberg Mfg. Co., Milwaukee, is retiring after 52 years of active service with the company. He was elected treasurer of the firm in 1910. In 1915, he became vice president, treasurer, and member of the board of directors. He was elected chairman of the board of directors of the company in 1945.

—o—

William M. Springer has been appointed x-ray products manager, photo products department, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. He replaces **Cyrus A. Poole,** who has been transferred to the company's Sales Research Division. Mr. Springer had been technical representative in Massachussets.

—o—

H. J. Stetina has been named district engineer, with headquarters in Philadelphia, American Institute of Steel Construction Inc., New York. The office, which had been closed since the death of the previous incumbent, **B. F. Hastings,** covers eastern Pennsylvania, New Jersey, Maryland, Delaware and the District of Columbia. Since 1941 Mr. Stetina had been an engineer with Cramp Shipbuilding Co., Philadelphia.

—o—

William L. Batt, president, SKF Industries Inc., Philadelphia, has been made an honorary companion of the Order of St. Michael and St. George by **King George VI** in recognition for his wartime work as a member of the Combined Production and Resources Board, composed of representatives of the United States, Canada and Great Britain. Mr. Batt also served from 1940-46 as vice chairman of the U. S. War Production Board. In addition, he served on the special mission to Russia, which visited Moscow early in the war to arrange for Lend-Lease shipments to the eastern front.



H. J. STETINA

—o—

W. E. Zander, director and vice president of foreign operations, Rheem Mfg. Co., New York, left the country recently for a tour of the company's Australian plants. He will visit company operations at Sydney, Melbourne and Brisbane.

—o—

Clifford A. Patch has been appointed sales manager, Western Division, Joshua Hendy Iron Works, Sunnyvale, Calif. Previously Mr. Patch had been assistant chief engineer, turbine sales manager and chief project engineer for Hendy. He succeeds **Clarence Jensky,** who has resigned to enter private business. **Charles A. Flannery** has been appointed assistant general products sales manager to assist Mr. Patch.

—o—

John S. Gregg will be transferred to the Milwaukee office, Inland Steel Co., Chicago, where he will serve as assistant district sales manager. He has been district sales manager of the company's Cincinnati office, which will close August 15. **L. W. Schellhammer** will become a resident salesman in Cincinnati, operating out of the company's Indianapolis office.

—o—

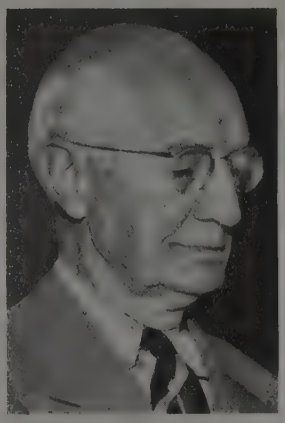
Edwin R. McPherson has been appointed plant engineer, and **Francis W. Gardner,** head of the standards department, Wilson Foundry & Machine Co., Pontiac, Mich. Mr. McPherson had been plant engineer and general superintendent of maintenance, construction and services for Campbell, Wyant and Cannon Foundry Co., Muskegon Heights, Mich. Mr. Gardner formerly was vice president of Management Engineering Research Institute, Detroit.

—o—

N. E. Olsen has been appointed manager at New Haven, Conn., for Graybar Electric Co., New York, succeeding **G. C. Krenning,** who died recently. Mr. Olsen has been with the company 24 years, and goes to New Haven from Syracuse, N. Y., where he had been manager since 1930.

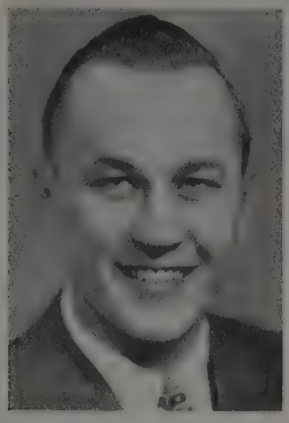
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Recent additions to the staff of Arthur D. Little Inc., Cambridge, Mass., industrial research organization, include **Daniel Reid Weedon Jr.,** packaging specialist; **Dr. Colin C. Reid,** organic chemist; **Dr. George P. Fulton,** biologist; and **Garvin**



JOHN W. PORTER

Retired president, Alabama By-Products Corp., Birmingham, noted in STEEL, July 15 issue, p. 92.



C. R. HARMON

Who has been named general sales manager, Penn Carbide & Alloy Casting Co., Canonsburg, Pa., STEEL, July 8, p. 93.



N. H. CRITTON

Who has been named eastern sales manager, Monarch Tool Co., Sidney, O., noted in STEEL, July 15 issue, p. 97.

Bawden Jr., market analyst. **Mr. Weedon, Dr. Fulton** and **Mr. Bawden** were recently released from the service. Dr. Reid was an instructor in chemistry at Williams College, Williamstown, Mass.

—o—

William K. Stamets Jr., recently released from the Navy, has resumed his duties with Wm. K. Stamets Co., Pittsburgh.

—o—

R. C. Garlick has been appointed assistant sales vice president, and **G. Finley Griffiths**, general sales manager, Sharon Steel Corp., Sharon, Pa. Mr. Garlick joined the company in 1909, and was general sales manager since 1940. Mr. Griffiths, who had been district sales manager of the Chicago area since 1940, joined the firm in 1938.

—o—

B. R. Queneau, recently released from the Navy, has been appointed chief development metallurgist, South Chicago plant, Carnegie-Illinois Steel Corp., a subsidiary of United States Steel Corp. Prior to his Naval service, Mr. Queneau was an assistant professor of metallurgy at Columbia University, New York. He also was employed at U. S. Steel's Duquesne, Pa., plant, and at its research laboratories at Kearny, N. J.

—o—

Thomas J. McGinnis, recently released from the Army, has been appointed assistant to the president, Koppers Co., Pittsburgh.

—o—

Goff Smith, recently released from the Army, has joined the railway sales department, American Steel Foundries, Chicago.

—o—

H. Hugh Willis, formerly vice president and general sales manager, Sperry Gyroscope Co. Inc., Brooklyn, N. Y., has joined Eversharp Inc., Chicago, as director of research, engineering and product development. He will establish and co-ordinate the activities of a centralized engineering research division in the New York area and direct engineering in all of the company's plants.

—o—

Sam H. Husbands, executive vice president, Trans America Corp., San Francisco, has been elected a director of General Metals Corp., Oakland, Calif.

—o—

Donald A. Potter, recently released from the Navy, has been appointed research and development engineer, Universal Castings Corp., Chicago.

—o—

William B. Breyley Sr. has resigned as vice president, General Drop Forge Division, Brown-Lipe Gear Co., Buffalo. **Eugene L. Oberly** of Lansing, Mich., has been made acting general manager of the Drop Forge plant.

—o—

Walter S. Corrie has been elected treasurer, National Gypsum Co., Buffalo. He succeeds Frank E. Davis, who continues as secretary.

OBITUARIES . . . .

William F. Disch, 65, secretary, Wrought Washer Mfg. Co., Milwaukee, died in that city, July 9. He had been with the company 38 years.

—o—

Frank E. McCormick, 73, general maintenance superintendent, E. C. Atkins & Co., Indianapolis, died recently.

—o—

William H. Snyder, 56, purchasing department, Republic Steel Corp., Cleveland, died in that city, July 15.

—o—

L. Waldo Thompson, 77, for 26 years president, Gardner Machine Co., Beloit, Wis., and more recently chairman of its board of directors, died in Beloit, July 10. He became chairman of the board of the company in 1940.

—o—

Richard N. Stillwell, 51, president and treasurer, Electric Wheel Co., Quincy, Ill., drowned in the Mississippi river near that city July 8 when his foot caught in the anchor line of his cabin cruiser and he was pulled overboard.

—o—

Edwin A. Bennett, 41, for 20 years a heating and ventilating engineer, American Blower Corp., Detroit, died in White Plains, N. Y., July 10.

—o—

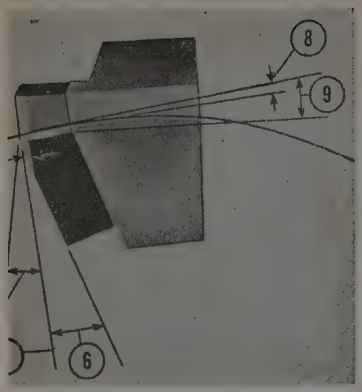
James W. Sherman, 65, retired automotive production specialist, died at his home in Warrensville Heights, O., July 16. During the war he had served as a member of the Properties and Industrial Division of the War Production Board. Prior to the war he had been associated with Chrysler Corp., Detroit, and Willys-Overland Motors Inc., Toledo, O., as a plant manager and production specialist.

—o—

John Andrew Kenney, 54, manager, technical sales service department, Barrett Division, Allied Chemical & Dye Corp., New York, died in that city, July 12.

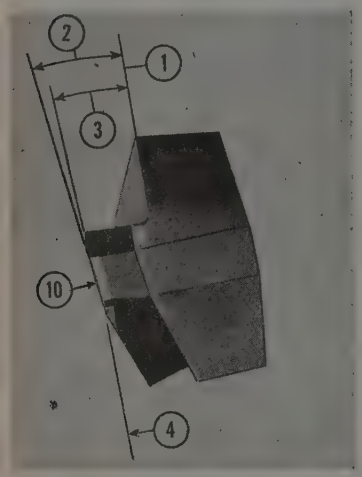
—o—

Walter J. Ahern, 46, president, Best Steel Co., Cleveland, died at his home in Mentor, O., July 13. He had been in the steel business more than 20 years, and 8 years ago organized his own concern.



Cutter Life . . .

as affected by the mounting of cemented carbide blanks



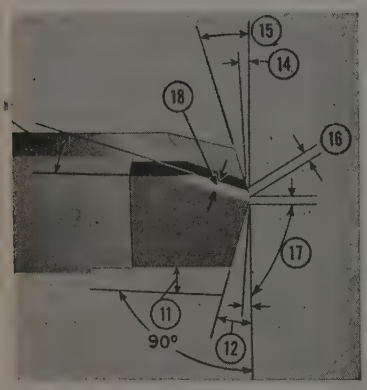


Fig. 1—Approved nomenclature applied to the cutting edges on face milling cutters

AL LINE
AL RAKE
AL BLADE
TING ANGLE
)IAL LINE
)IAL RAKE
)IAL BLADE
TING ANGLE
IPHERAL CUTTING
GE ANGLE
)RNER ANGLE)
IPHERAL RELIEF
GLE
IPHERAL
ARANCE ANGLE

10 PERIPHERAL LAND
11 FACE BLADE SETTING ANGLE
12 FACE CUTTING EDGE ANGLE (2ND CONCAVE)
13 FACE LAND
14 FACE RELIEF ANGLE
15 FACE CLEARANCE ANGLE
16 CHAMFER
17 FLAT (1ST CONCAVE)
18 RIDGE

DO YOU remember all the trouble that was experienced when the milling of steel with carbides was first started? There was plenty of it, and yet it's easy to look back now and wonder what all this trouble was about. Engineers who were familiar with carbide application work had tooled up many single point tool interrupted turning, facing and boring jobs by using the negative engagement angle method when machining steel.

When the milling of steel with carbides started, no one really appreciated the similarity between the way the face of a cutter tooth approached the work and the way an interrupted cut on the work approached the cutting edge on a single point tool. In brief, no one at that time fully appreciated the importance, in milling steel, of the double negative engagement angle between the cutting edge and the work outline.

In milling steel, there was a tendency to use the thinner carbide blanks like those which had been used for milling cast iron or nonferrous materials. When the entire cutting face of these thinner carbide blanks was set at the necessary double negative rake angles, there was a tendency for the heavier impact loads developed from milling steel to crack the tips because the direction of the cutting pressure was across the tips. It was claimed by some carbide cutter users that when they took very heavy cuts with face mills having solid cast iron bodies they had plenty of cracked tips.

Others mentioned that they were not able to reduce their steel milling difficulties until they had brazed thicker carbide blanks to heat-treated alloy steel bodies. Even then there was still trouble with occasional braze cracks developing in the carbide tips due to a lack of braze control. These cracks would practically always be parallel to the braze line. The thicker tips would also crack occasionally. This was caused by localized heat developing when too much stock was removed per wheel pass from the entire tip face during the sharpening operation.

Some cutter manufacturers tipped their standard blades with carbide blanks for use on steel. Most of them used carbide blanks which were too thin. Since it was not easy to remove the blades from the cutter bodies for grinding the steel behind the carbide blanks, work was done on a cutter grinder. This created much localized heat which resulted in cracked tips. Another thing—the grinding time was excessive. This tended to discourage some cutter manufacturers from applying their particular pat-

By FRED W. LUCHT
Development Engineer
Carboloy Co. Inc.
Detroit

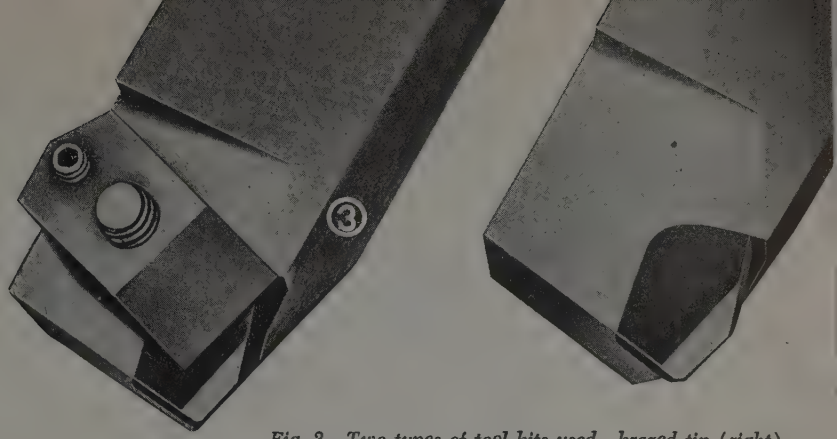


Fig. 3—Two types of tool bits used—brazed tip (right), and mechanically-held tip (left)

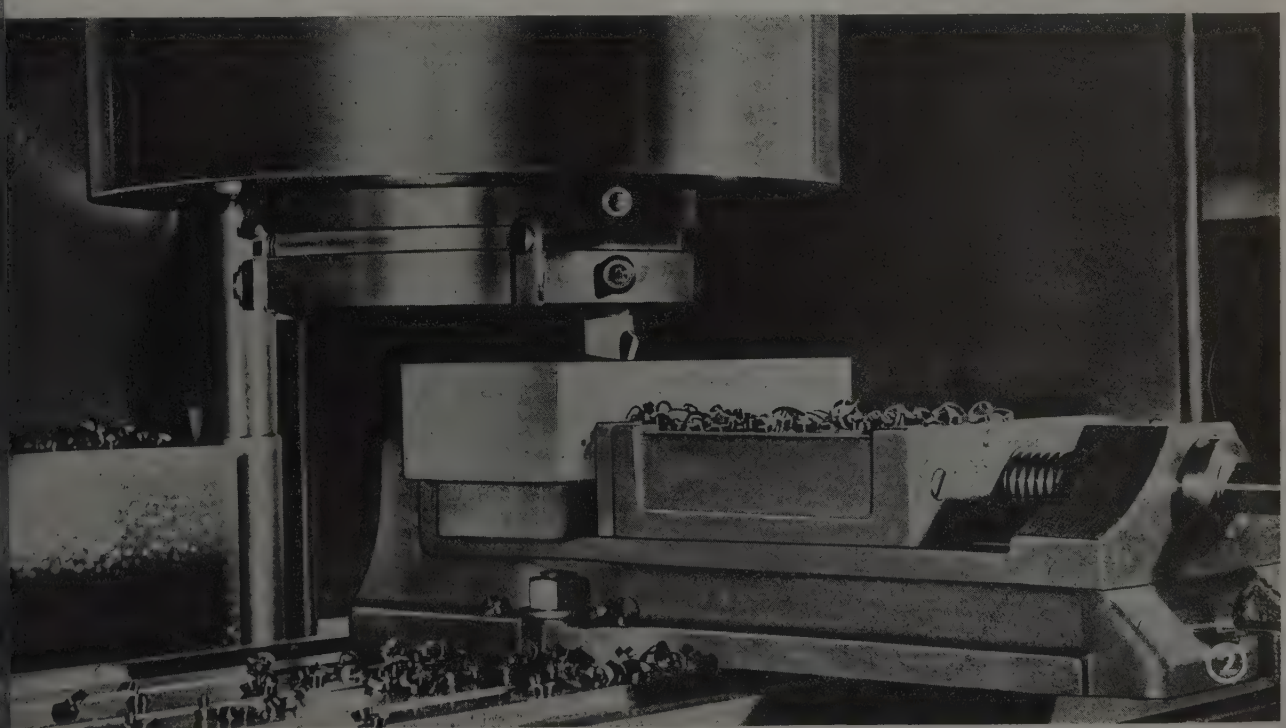
ented blade-locking devices to cutters for milling steel with carbides.

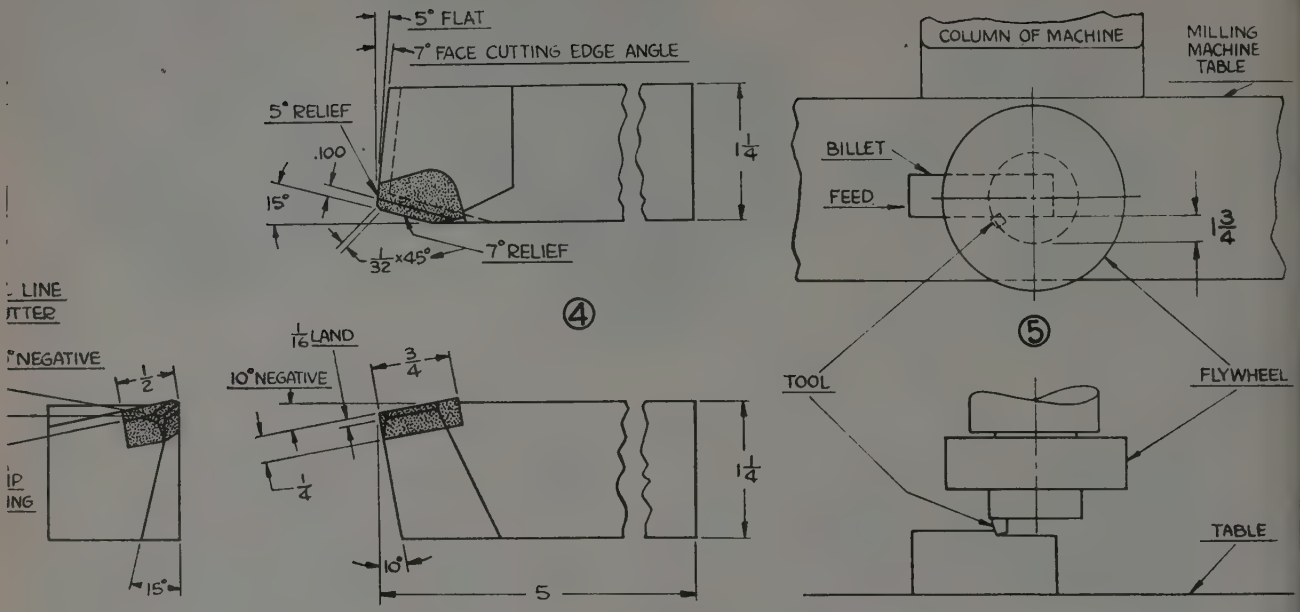
The availability of carbide at reduced prices also encouraged the use of solid carbide blades which were clamped into the cutter bodies with wedges. While this did eliminate the so-called brazing difficulties, it also created new problems. To maintain the required accuracy in the body, it was found necessary to mill the blade slots in the heat-treated bodies with carbide-tipped slotting cutters. No comment will be made concerning the grinding block method for sharpening the blades and the method used for assembling the blades in the cutter body other than to say that it is a highly controversial subject. The only way to obtain an accurately finish-milled surface with a multi-tooth face mill is to re-grind the face of the cutter and the chamfer on a cutter grinder. The advisability of using a straight diamond wheel on a surface grinder for sharpening solid carbide blades is questionable because it never leaves so smooth and so accurately ground surface as a cupped type of diamond wheel. The reason for this is the same as for a face milling cutter which always produces a better surface than a plain milling cutter.

During the war, many cutter users made face mills by inserting standard carbide single-point tool bits into steel bodies. They found that it happened to be the quickest way to handle many of their rush steel milling jobs because they could not wait for the extremely long delivery dates quoted by the milling cutter manufacturers at that time. This practice also eliminated the brazing problem because the tool bits which they used were brazed under the simple every-day high production technique practiced by the carbide manufacturers. These mills gave outstanding results when the tool bits were new, but the carbide tips usually cracked after a few grinds.

The reason for this was that the standard ½, ⅝ and ¾-in. square tool bits ordinarily used for this work had carbide tips that were much too thin for this type of opera-

Fig. 2—Typical set-up of 5HM vertical milling machine used in tests

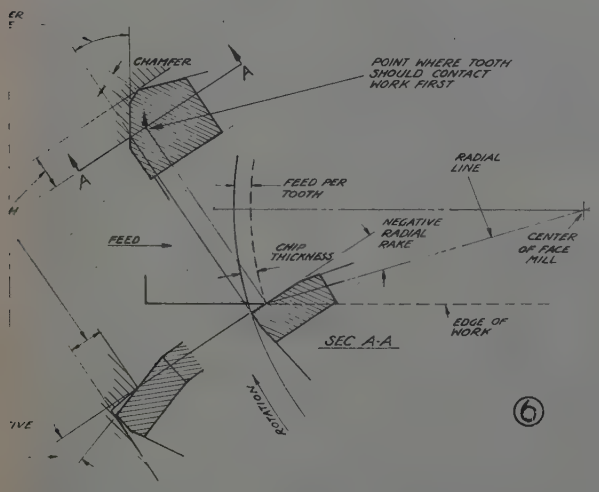




tion. It was found that when carbide blanks not less than ¼-in. thick were brazed to ¾ and 1-in. square shanks, there was no braze problem. When these carbide blanks were positioned on the tool bits to produce a negative angle in the axial direction Fig. 1, and a 10 to 15° positive angle in the radial direction, and when these tool bits were properly positioned in the cutter body and finally sharpened, the entire carbide face milling problem took on an entirely new aspect.

The carbide and the steel behind the cutting edge along the corner angle and along the face of the cutter can be quickly removed on a single-point tool grinder when using a 60-grit silicon carbide wheel by grinding one tool bit at a time. A grinding template can be used to maintain the proper tooth shape.

The face or ridge on each tooth can also be ground to the proper negative radial rake angle with a 180 or 220-grit diamond cup wheel on a single point tool grinder.



The relief angle behind the cutting edge can be finish ground along the corner angle with a 180 or 220-grit diamond cup wheel on the single point tool grinder. All the tool bits in the face mill body can be assembled to a common indicator reading taken at the corner angle.

Use a 180 or 220-grit diamond cup wheel on a cutter grinder to grind the face relief angle and flat along the face of the cutter and finally the chamfer relief angle. The stock removal is light, the operation is fast, and the face of the cutter will run true within 0.0003 to 0.0004-in. without any difficulty. A face mill ground in this manner will mill a smooth and flat surface and will give maximum cutter life.

It has been claimed that any tool bit or inserted blade type of face mill, which is designed to simplify the sharpening operation, will produce as many parts per grind as any face mill which uses the mechanically-held solid carbide blades. Tool bits should be well proportioned and should have a thick carbide blank with the cutting face side of the blank set to give a positive radial setting angle and a negative axial rake angle.

The considerable controversy over the use of brazing or the mechanical holding of cemented carbide blanks in face mill bodies, resulted in the investigation to be discussed.

Equipment and Procedure: As used in former investigations a No. 5HM vertical milling machine was again employed, Fig. 2. This illustration also shows the 8-in. diameter single-tooth fly cutter and the 18¼-in. diameter by 5⅞-in. thick sectional type flywheel. The combined weight of the cutter-flywheel unit was 515 lb.

Workpieces consisted of 5 x 6 x 12 in. SAE-1045 forged steel billets heat-treated to give a hardness of 190-210

Fig. 6—Negative engagement angle was obtained between the cutting edge and the work, in both axial and radial directions

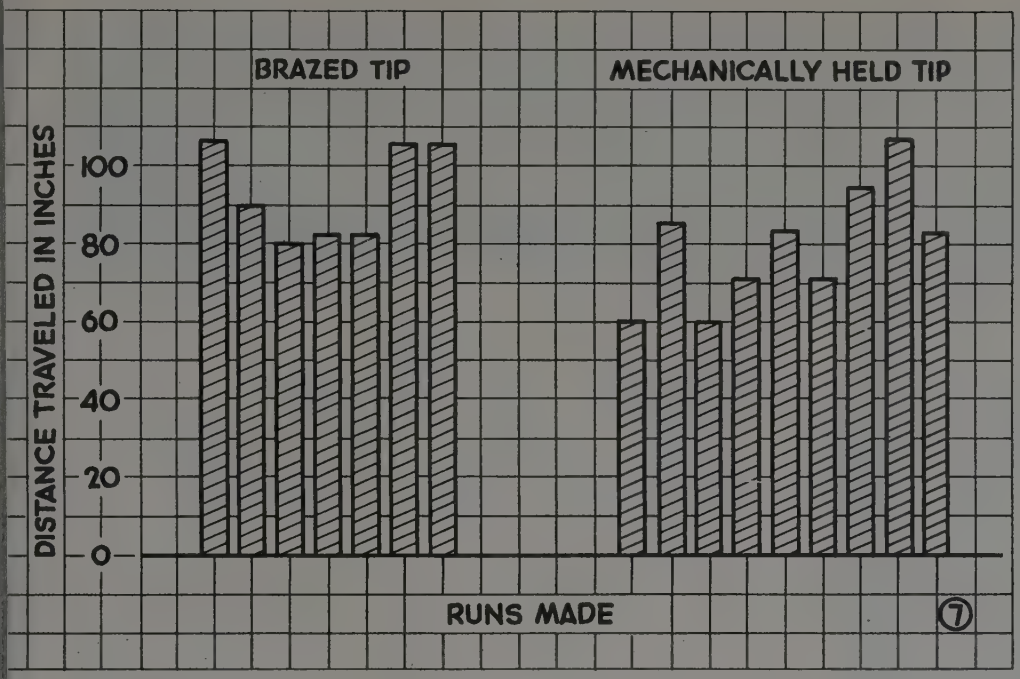


Fig. 4—All tool bits are ground to the same cutting angles (clamp is not shown here)

Fig. 5—Outline of plan view of the milling set-up that was used

Fig. 7—Graphically portrayed results show that carbide blank brazed to a tool shank gave longer life than when it was mechanically held

brinell. These billets were rigidly held in a plain vise. A tool bit is also shown in the flycutter body.

Fig. 3 shows the two types of tool bits used. These tool bits are identical in every detail with the exception of the method of attaching the carbide blanks to the tool bit shanks. Easy Flo No. 3 was used to braze the carbide blanks into the cavity on one set of tool bits. The other set had the carbide blanks mechanically clamped into the cavity. All carbide blanks were made from Carboloy grade 78B, a general steel milling grade.

Fig. 4 shows the grind used on all the tool bits. This tooth has a 10° negative radial rake, 10° negative axial rake, 15° corner angle, 5° flat, 1/32 x 45° chamfer, 7° relief along the corner angle and the chamfer. The face of the carbide blank has a 10° positive radial blade setting angle and the ridge is 0.100-in. wide. Clearance angles were ground with a 60-grit silicon carbide wheel. Ridges on the face of the teeth, peripheral relief angle, face relief angle, flat, and chamfer relief angle was ground with a 220-grit diamond cup wheel.

The cutting edges were inspected at 21.5 magnifications with a tool maker's microscope and reground if necessary until the cutting edges were completely free from flaws.

Cutting edges along the corner angle and the chamfer were brushed lightly with a 320-grit silicon carbide hone which was held at about a 45° angle to the face of the tooth. During the stoning operation the hone was not only moved in the 45° direction but also parallel to the cutting edges. This operation removed any slight irregularities along the cutting edge and gave more stable results.

Every mechanically clamped carbide blank was inspected for movement during the cut. This was accomplished by taking a measurement from a prominent, well protected point on the carbide blank to another prominent point on the tool bit shank after the cutting edge was stoned and just before the tool was run. This measurement was taken with the tool maker's microscope and recorded. The graduations on the microscope enabled the readings to be taken within a fraction of 0.0001-in. The same measurement was repeated after each run was completed and recorded. It was interesting to find that none of the mechanically held carbide blanks moved, which indicated that the method of clamping was satisfactory.

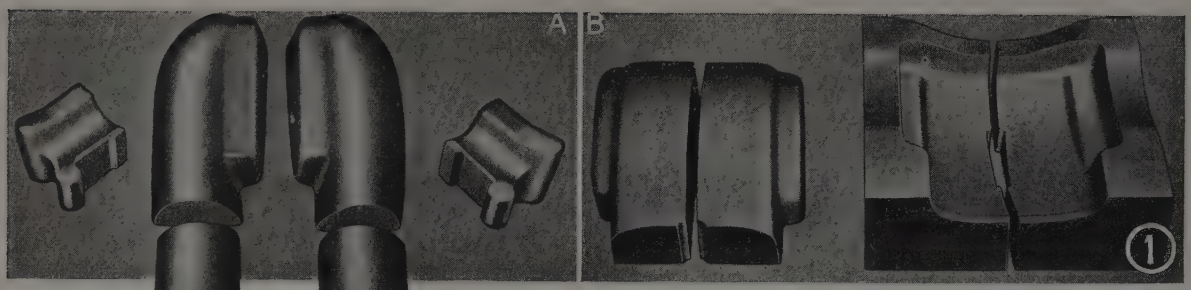
The tool bits were positioned in the tool bit slot in the cutter head by the aid of two sets of shims of various thicknesses. Arrangement provided a means for maintaining not only the 8-in. cutting diameter but also the 10° negative radial rake, constant for all runs.

Fig. 5 shows an outline of the plan view of the entire milling setup. Particular attention was given to maintaining the 1¾-in. dimension, which is the amount the outside diameter of the face mill overhung the work at the side where the cutting edge entered it.

An enlargement of the portion of the cut at the instant the face of the tooth first contacts the work is shown in

(*Please turn to Page* 126)

This article is based on the address delivered by Mr. Lucht at the production engineering session, June 17, 1946, during the semi-annual meeting of the American Society of Mechanical Engineers. The editors of STEEL are indebted to that society, to Carboloy Co. Inc., and to Mr. Lucht for permission and facilities to present this timely and interesting exposition of practical metal cutting investigations typical of those being encouraged by the research committees on metal cutting and cutting fluids, and the production engineering division of ASME.



Cast-To-Shape Tool Steels

. . . . require minimum finish machining, thus accomplishing savings in labor, material, and processing costs

VARIED applications are being found for tool steel dies which are cast to the shape in which they will be used during production. In fact, not only are the steels cast to form such dies as forming, blanking, coining, swaging, drop forge trimming dies, etc., but are also adaptable to such castings as cams, mixer paddles, seaming rolls, spinning rolls, automobile rim rolls, rotary shears, gages—such as thread, plug, ring and snap gages—as well as lathe centers and mandrels. Inasmuch as these articles are subjected to different service conditions, various steel compositions have to be employed in their manufacture. This latter fact, however does not impose any appreciable limitations on the cast-to-shape technique.

One of the most important reasons for the wide acceptance of these cast parts is that they require minimum machining before being placed into service. Therefore, considerable savings are realized in

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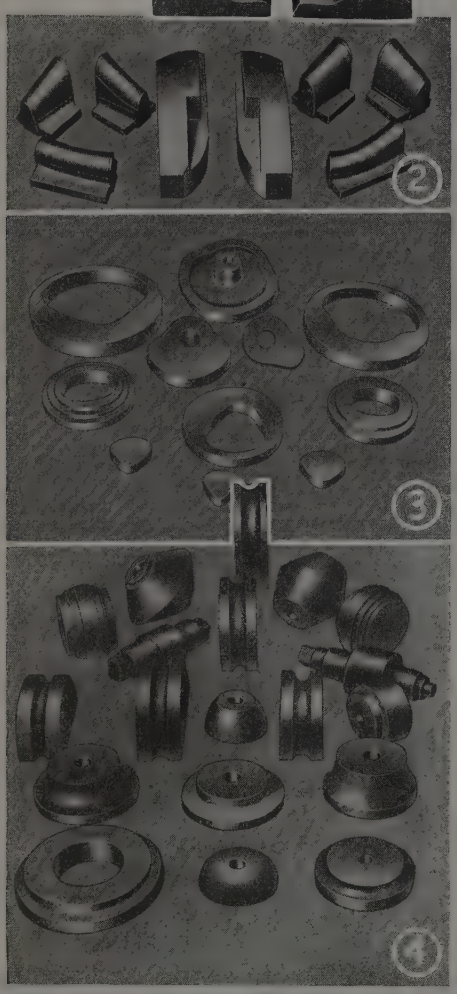


Fig. 1—Applications for the automotive industry include (A) punches for fender guards and (B) punch and die for another type of fender guard. Steel used in these cast-to-shape punches and dies are of the high carbon-high chromium air-hardening steel containing cobalt, nickel and molybdenum

Fig. 2—Punches and dies for automobile bumper guards. Steel used for these tools is similar in composition to that employed in the articles illustrated in Fig. 1. This analysis produces tools of toughness and good resistance to abrasive wear

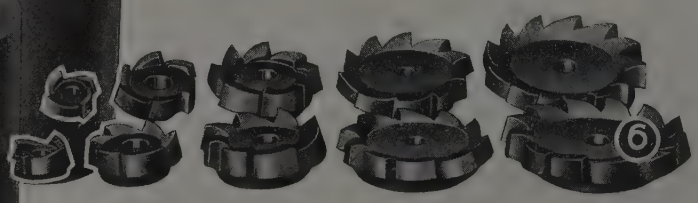
Fig. 3—A group of cams made from Jessop's 3-C special tool steel

Fig. 4—Typical cast-to-shape male and female tube forming rolls made from Jessop's 3-C special tool steel

Fig. 5—Various size cutter bodies also made by the cast-to shape technique. Steel used for these was of the high carbon-high chromium air-hardening type

Fig. 6—Ring dies made from an oil-hardening tool steel which can be tempered to a rockwell C hardness of 65. These dies are made in sizes up to and including 16 in. outside diameter and in lengths up to 15 in.





ENGINEERING NEWS at a glance

TWO thousand dollars in cash prizes are offered by Resistance Welders Manufacturers' Association, Philadelphia, for papers on resistance welding, including design, application and research. First prize is $750. Papers entered in the contest should be sent to the American Welding Society, 33 West 39th street, New York. The society will appoint five judges to select the winning papers.

FACILITIES for drawing and insulating wire for motors are to be included in Westinghouse Electric Corp.'s new plant now being established in the former Curtiss-Wright Aircraft plant at Buffalo. The plant, being reconverted for the production of all except fractional horsepower motors at a cost of $1,500,000 also will include an ultramodern materials handling system.

HARMFUL deterioration of steel structures in the weld zones as well as in heat-affected zones is avoided by a new welding method for all types of steels developed by Karl Spitz, Cleveland research engineer. According to the engineer, the method also improves welding of manganese steels, and in joining s'eels of different compositions. When joining high carbon steel, 75 per cent carbon, the weld and heat affected zone show a soft, normalized structure which can be machined and even cut with a hacksaw by hand; in welding armor plate, the joint and heat affected zone show an even hardness. Improved chemical corrosion resistance is provided by the weld when the method is used to join stainless steel.

AUGUST 5 is the date set by General Electric Co. for the formal re-opening of its electric lighting institute at Nela Park, Cleveland. The institute was closed during the war. It is now in the process of being completely rebuilt to serve both present and future needs of the company's lamp department. Some 30 architects, designers, artists, 100 engineers, technicians and workmen are working on the project.

BELTS used to drive industrial machinery often become heavily charged with static electricity, resulting in the generation of sparks. To offset this potential hazard, according to Acheson Colloids Corp., Port Huron, Mich., industries manufacturing or handling volatile flammable liquids are employing "dag" colloidal graphite to dissipate or bleed off the static electricity. In treating drive belts, the product is diluted with a volatile fluid, then applied to the under or pulley side of the drive belts. This forms an electrically conductive film which bleeds static electricity continuously to the earth. To be effective, the conducting coating should be used on devices equipped with metal pulleys. Furthermore, it is essential that pulley shafts are grounded. This usually is done by using a carbon brush so mounted that it rubs on the shaft. Pigtail of the brush then is connected to a suitable ground such as water pipe.

TWO new aeronautical material specifications and 21 revisions of former specifications are being published by the Society of Automotive Engineers, New York, as of June 1 of this year. These may be obtained from the society for 95 cents.

SPRAY booth side walls, their louvers and conveyor hooks treated with Detrex Corp.'s new protective coating, Triad Pr, is said to make cleaning an easy operation. Besides enabling paint to be flushed off walls easily, the coating provides a brilliant white surface that improves visibility in the booth. The product, according to the Detroit company, can be applied to side walls of either wet or dry booths with a brush or spray gun.

FELT washing compound which is not affected by hard water and can be used as a detergent with acids and alkalies is now available from National Oil Products Co. According to the Harrison, N. J. chemical manufacturer, the product called Syntergent K, is one of the few cation-active detergents offered for felt washing. It is described as a light, amber colored liquid with a pH that is much closer to neutral than the alkalies such as soda ash or trisodium phosphate.

SAUERKRAUT juice is one of the strongest of natural food acids. It will stain many surfaces if allowed to remain on them long enough. According to the Porcelain Enamel Institute, Washington, it is so strong that manufacturers of porcelain enamel products, wishing to give their products the ultimate test, boil them in sauerkraut juice for hours.

BECAUSE of wartime shortages, the Germans progressively decreased the tungsten content in high-speed tool steel from more than 12 per cent in 1938 to 1½ per cent or less in 1944, a report by the Department of Commerce revealed. The composition in general use in 1944 consisted of carbon 0.92-0.98 per cent, chromium 3.50-4.00 per cent, vanadium 2.70-3.00 per cent, tungsten 1.20-1.50 per cent and molybdenum 2120-2.50 per cent. Also a small amount of titanium was added in some mills. Some German manufacturers stated that, properly ground and hardened, the low alloy steel gave satisfactory results. Others said the low red hardness of the steel necessitated a 35 per cent reduction in tool speed.

FANTASTIC predictions by artists and designers that plastics will replace metals, wood, leather and glass in the coming "plastic age" are being discouraged by conservative members of the industry in favor of looking upon plastics as the partner of these materials, according to a booklet issued recently by Behr-Manning Corp., Division of Norton Co., Troy, N. Y. Plastics, it says, have color; they are lighter than metals and glass; they do not rust and many of them are resistant to acids and alkalies which affect metals. They are water resistant and insect proof. All of them are capable of being molded into shapes impossible to obtain in these other materials, or possible only through expensive machining operations. Beyond these considerations, plastics have their limitations in which metal and other materials excel them. To the extent that these other characteristics are more important to the particular product, then plastics as we now know them cannot hope to replace these other materials. Partnership approach is, therefore, probably the most intelligent one.

In the following discussion on the strength and ductility of bolts, the author proposes a standard method for determining these properties

Testing

STRENGTH and ductility are two important characteristics that determine the usefulness of a bolt—aside from dimensions and surface finish. Both of these properties are expressed in several different terms, and sometimes are not clearly defined. To eliminate confusion now existing, the specification and testing of bolts should be standardized.

Both strength and ductility are determined by

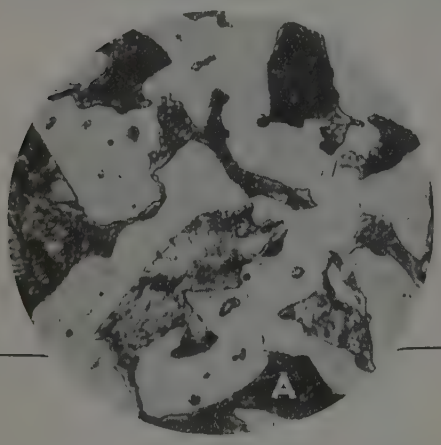
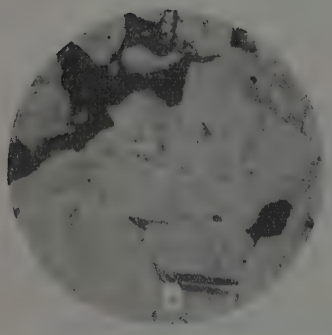
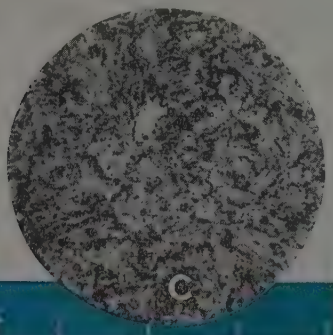


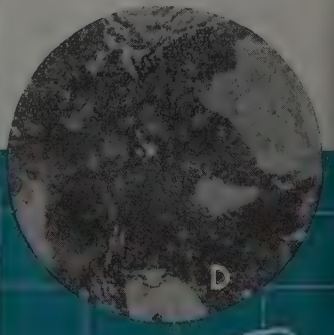
Fig. 1—Effect of structure upon properties. Diagrams and photomicrographs (1000X) are from 0.35 per cent carbon steel, ½-in. NC threads extruded and roll threaded

Fig. 2—Chart showing method of determining yield strength

Fig. 3—Effect of length of thread exposed on tensile properties of bolts. Results are averages of three tests on ½-in. NC bolts, not heat treated, made from same wire. Illustrations and data in this article are by courtesy of American Institute of Bolt, Nut and Rivet Manufacturers





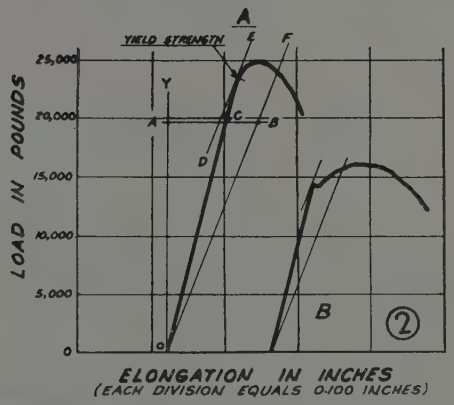


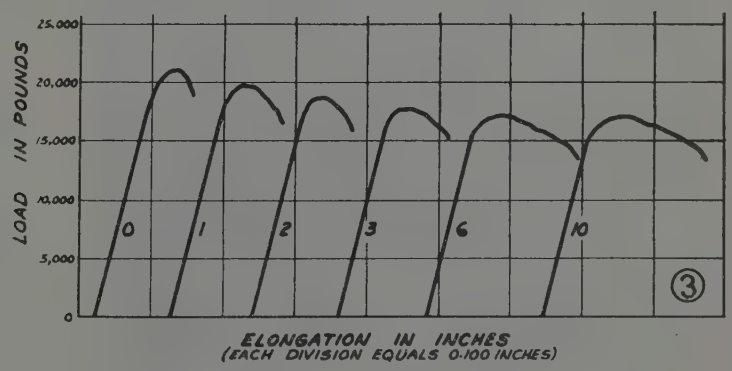
By D. E. LEHANE
Metallurgist
Russell, Burdsall & Ward Bolt & Nut Co.
Coraopolis, Pa.

Bolts for strength and ductility

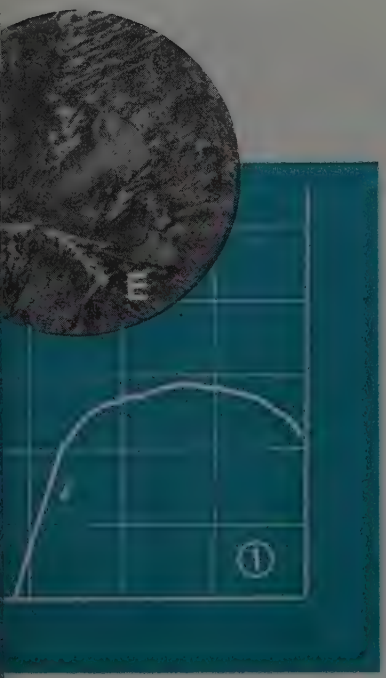
gradually applying a tensile load on a full-size bolt in a testing machine. As load is applied and the bolt stretched, a plot is made of the load and corresponding extension of the bolt. This is called a load-elongation diagram. Five of these diagrams are shown in Fig. 1, representing tests on five differently heat-treated bolts. Straight portion of each curve represents elastic range of the bolt. If a load within this range is applied and then removed, the bolt will return to its original length. Beyond the straight portion is the plastic range, where permanent deformation occurs. Extent of the plastic range is a measure of ductility—measured horizontally. It is greatest in E, and extremely small in B. Strength, of course, is measured vertically, yield strength being load at the

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No. of Threads Exposed	Tensile Strength (psi)	Yield Strength (psi)	Plastic Elongation (0.01 in.)
0	145,250	134,000	5
1	136,000	121,500	7
2	128,000	112,500	8
3	128,000	116,000	9
6	124,000	112,000	15
10	124,000	112,000	16



A—Not heat treated. Typical of bright bolt or screw. Structure is ferrite (white areas) and pearlite (dark areas). Diagram shows low ductility and low ratio of tensile yield

B—Fully quenched, not tempered. Structure is practically all martensite. Diagram shows no plastic elongation (extremely brittle) and high strength. Ratio of tensile to yield is 100 per cent

C—Quenched as in B but tempered at 1000° F. Structure is tempered martensite. Diagram shows moderate ductility and relatively low ratio of tensile to yield

D—Special quench, not tempered. Structure contains some martensite (gray) acicular ferrite (white) and large amounts of higher transformation products (dark). Diagram shows moderate ductility and relatively high ratio of tensile to yield

E—Quenched as in D but tempered at 1000° F. Structure is tempered martensite and higher transformation products and acicular ferrite. Diagram shows high ductility and high ratio of tensile to yield

DRAWING STRETCHING STAMPING OF

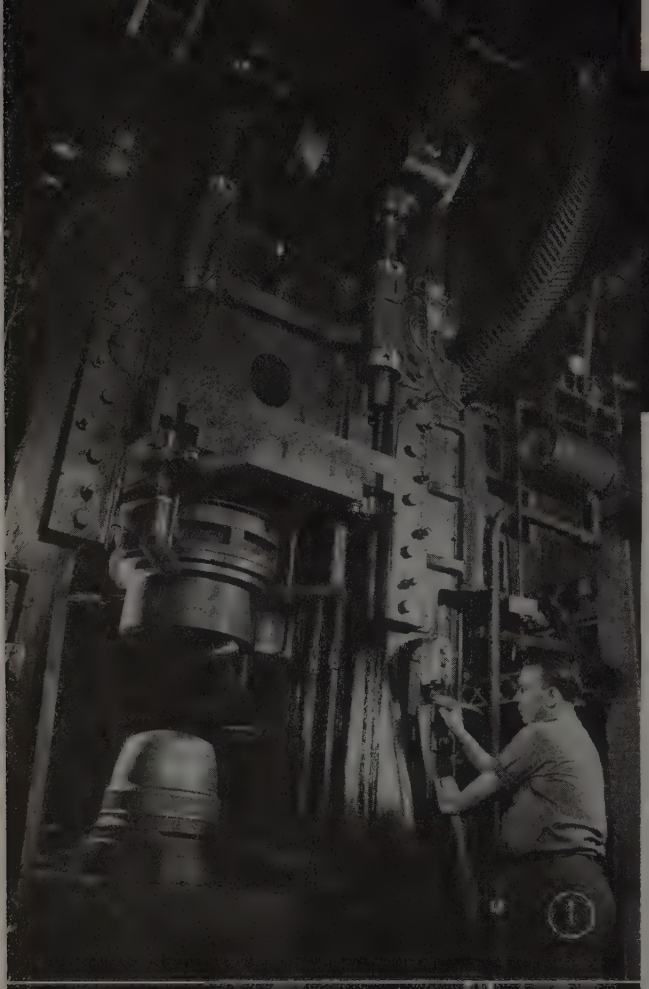


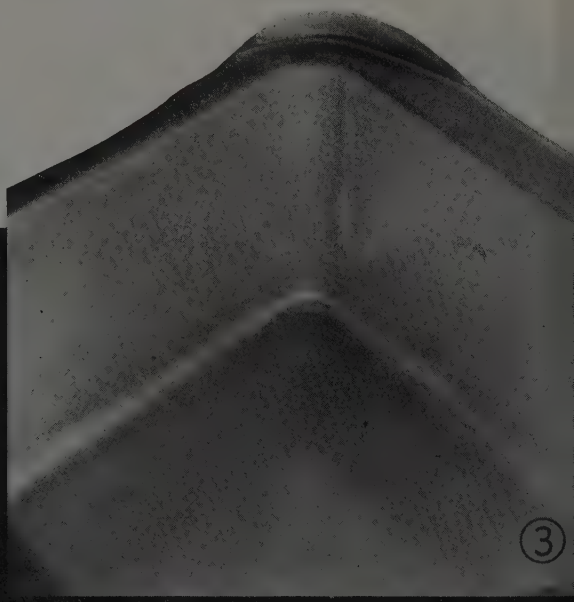
Fig. 1—A double-action toggle press set to "cap" the top half of a 15½ gal aluminum alloy beer barrel

Fig. 2—Single-action knuckle press performing initial drawing operation in production of aluminum alloy part from a circular blank

Fig. 3—Scribed lines show that drawing operation "plastically rearranges" metal, changing area of squares and gage but slightly

Fig. 4—Lines scribed on these drawn aluminum shells show flow of metal. Drawing has changed shape of squares but has changed area but little, showing that drawing has little effect on thickness





ALUMINUM

A description of forming procedures which utilize to best advantage special properties of Alcoa's "common alloys" and the widely used Alclad series

By HARRY L. SMITH Jr.
Manager, Sheet Sales
Aluminum Co. of America
Pittsburgh

ALUMINUM may be drawn into shell-like shapes in either a single or double-action press. Because of its high rate of production, the double-action press has found increasing use in industry. Although the design of press tools for drawing aluminum is different from that used for other metals, the tools themselves are similar and consist of die, knockout, punch, and blankholder.

The shape of the drawn object, the diameter and thickness of the blank, the alloy and temper of the sheet being used are some of the factors which influence the size and capacity of the press to be used in a given drawing operation. A single-action press is adequate for simple draws and no blankholder is needed if the reduction is small and the pieces are thick enough not to wrinkle. If blankholder pressure is necessary, it can be supplied by springs or an "air cushion."

Deeper draws require the double-action or toggle press with mechanical links or cams to exert suitable pressure on the blankholder. In a double-action press, the blankholder is attached to the outer ram which comes down first and holds the blank with suitable pressure. The inner ram descends and the punch is forced into the die, drawing the blank through with it to form the shell. The blankholder holds the blank only enough to let it slide smoothly over the edge of the die. If held too tightly the metal will split; if held too lightly, it will wrinkle. The approximate sizes of blanks that can be drawn on various sizes of presses are given in Table I. Fig. 1 shows a double-action toggle press set to cap the top half of an aluminum alloy barrel. A single-action knuckle press, shown in Fig. 2, is performing the initial drawing operation in the production of an aluminum alloy part from a circular blank.

The drop hammer, Fig. 6, is also used for many drawn shapes where the expense of elaborate dies must be eliminated. Satisfactory drawn shapes can be made in this way if the punch and die are kept clean and the blank liberally lubricated with ordinary cup grease. The drop hammer has found increased use among aircraft manufacturers in the production of aluminum sheet panels for wing tips, fins and control surfaces and fairings.

At the present time seven aluminum alloys are commonly used for the production of drawn shapes. These are designated by the Aluminum Co. of America as 2S, 3S, 52S, 24S, and Alclad 24S, 61S, Alclad 14S and Alclad 75S.

The first three are generally referred to as "common alloys" as their mechanical properties can be increased only by cold work. The temper is designated as O for annealed sheet, H for full hard and ¼H or ½H for intermediate tempers. The last four are heat-treatable alloys since they contain other metal constituents that make possible an improvement in mechanical properties through heat treatment. The soft or annealed temper is designated as O, the temper obtained by quenching from the proper heat treating temperature in cold water and aging at room temperature is designated as W, while that obtained by aging the quenched sheet at elevated temperatures is designated as T.

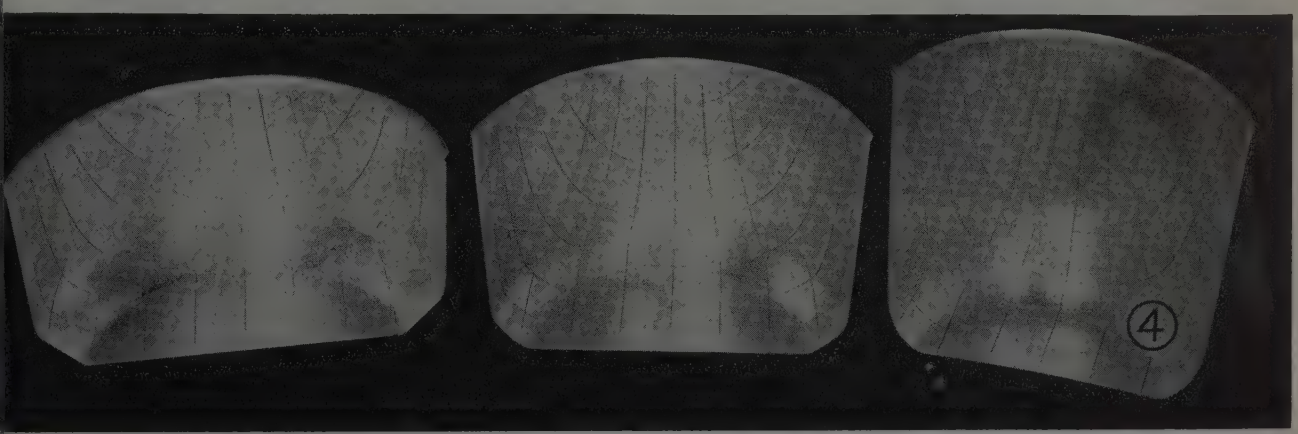




Fig. 5 — Up-thrusting form of stretch press stretches aluminum sheet which is held tight at ends by compressed air clamps

An exception is 24S and Alclad 24S, which develops the T temper after quenching within a few hours at room temperature.

The severity of the draw determines the proper temper of non-heat treatable alloys to use. For severe draws, annealed sheet is employed, but half-hard or full-hard sheet may be quite satisfactory if draws are to be less severe. The softer alloys such as 2S or 3S, can be drawn deeper with less operations than 52S or the heat treatable alloys. In drawing heat treatable alloys which require artificial aging to develop maximum strength, either the annealed (O) or as-quenched (W) temper may be used depending on the severeness of the draw.

Alloys that have been drawn in the W temper may be subsequently artificially aged at 320° F or slightly higher temperature, the time of such heating being dependent upon the aging temperature chosen. This aging converts the metal to the T temper with a resultant increase in physical strength.

Whenever possible the W temper rather than the soft or annealed temper of heat treatable alloys is used, as this eliminates the necessity for heat treating the drawn shells which are apt to distort during quenching and require corrective operations. The compositions and the properties of these alloys in the various tempers are given in Table II.

After heat treatment, alloy 24S will age-harden at room temperature to the T temper. In this temper alloy 24S can only be drawn into shapes which require a limited amount of forming. Immediately after quenching, however, alloy 24S has much better workability. By holding the sheet at 32° F in a mechanical refrigerator, age-hardening will be retarded and maximum workability will be preserved for almost 24 hours. Age-hardening will be retarded indefinitely if the sheet is held at 0° F. Although the refrigerator will maintain a more uniform temperature, dry ice has been found satisfactory in many applications.

Tools for drawing aluminum alloys should be designed so that the thickness is reduced but little during the drawing operation. For this reason, it may be necessary to redesign tools originally made for drawing brass or steel before they can be used with aluminum. The latter metals frequently can be reduced in thickness as much as 50 per cent, but aluminum usually cannot.

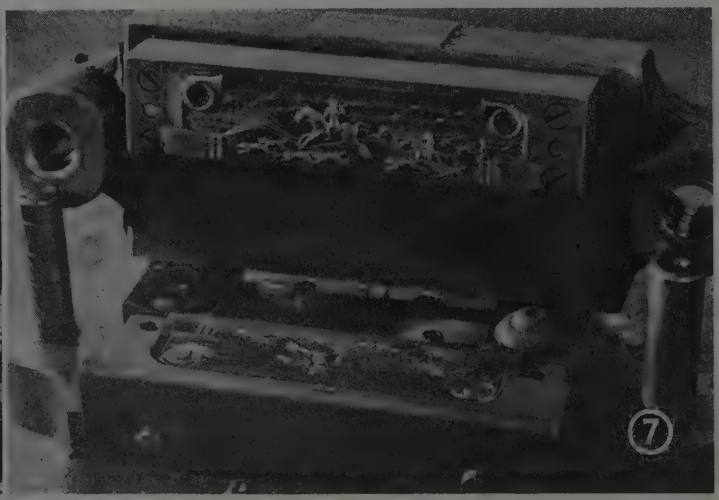
Cast iron, high grade alloy steel or carbon steel are the materials from which drawing tools are usually made. The choice among these materials depends upon the type of draw, the alloy being formed, the quantity of drawn products to be made, the finish desired and other factors. Cast iron tools are sufficient if it is necessary to keep tool costs low and if the number of pieces to be produced is relatively small. Such tools are also suitable for larger production when high surface finish is not important. High-grade alloy tool steels will give best results if the extra cost is justified by large production runs, or if hard aluminum alloys are to be formed. Regular carbon steels containing 0.6 to 1.10 per cent carbon are intermediate in cost and performance between cast iron alloy steels.

The general principles for design of draw tools for aluminum are the same as for other metals with the exception that the amount of reduction per draw, the radii on the tools, and the change in metal thickness will vary. The radius of a drawing die edge should normally be no less than four times, and no more

Fig. 6—Drop hammer being used for forming operation, doing away with expenditures for elaborate dies

Fig. 7—Open halves of embossing die used to decorate an aluminum product





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AIR-HARDENING TOOL STEEL

that gives you

EASY, LOW TEMPERATURE HEAT TREATMENT

VEGA

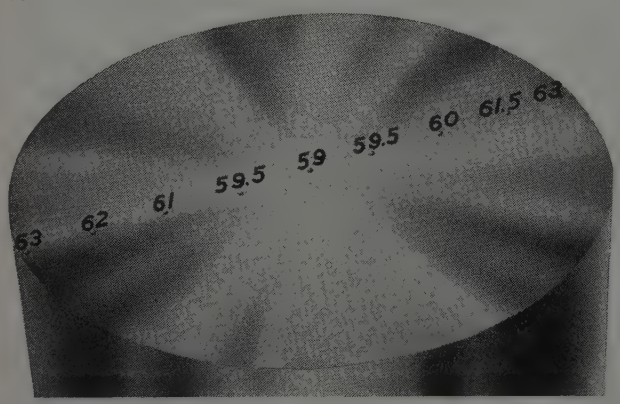
U. S. Pat. 2,355,224

The fact that VEGA can be heat treated from a temperature 200°F lower than the 5% chromium air-hardening steels often eliminates the need for expensive pack hardening to avoid excessive scaling. And because the hardening temperature for VEGA is only 1550°F, no special high temperature furnaces are required. These two advantages alone enable VEGA to do more than "pay its way" in your tool room.

UNIFORM HARDENING IN VERY HEAVY SECTIONS

This new steel combines the deep-hardening characteristics of air-hardening steels with the simplicity of *low temperature* heat treatment. Notice the uniformity of Rockwell hardness values from surface to center of this 8" VEGA round. On your jobs such as blanking, piercing, trimming and forming sheet metal in light and heavy gauges — jobs where minimum distortion and size change, uniform hardening in very heavy sections are required—VEGA gives you long tool life, low production costs.

Inside Rockwell "C" Hardness of Section Cut Midway on 8" Round x 15" Long VEGA. Air Cooled at 1550°F 1 Hour at Heat.



CHECK THESE EXTRA ADVANTAGES YOU GET WITH VEGA

- Minimum Distortion and Size Change
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- High Degree of Toughness with Good Hardness to Resist Shock and Wear



This folder contains complete information on VEGA—its properties, heat treatment and use. To put VEGA's new advantages to work in your tool room ask for the new VEGA folder. Just drop us a note on your company letterhead, indicating your title.

THE CARPENTER STEEL COMPANY, 139 W. BERN ST., READING, PA.

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AIR-HARDENING
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than fifteen times, the original thickness of the metal being drawn. The proper radius to use will depend upon the alloy and temper of the blank and type of draw. The punch radius should be kept to a minimum of four times the metal thickness. If the radius is too large, wrinkles may occur in the shell sidewall; if too sharp a radius is used, it will resist the flow of the metal and cause fractures.

In the drawing operation, aluminum strain-hardens and changes from annealed to the harder tempers, with a corresponding increase in tensile and yield strength. As a result, it becomes less workable and the reductions per draw must be decreased in successive draws. For deep-drawn cylindrical shells in alloys 2S-O and 3S-O, the reductions in diameter per draw should be as shown in Table III. There is very little change in hardness after the third draw, and the 15 per cent value given in Table III is suitable for the fourth and all later draws. The harder alloys, such as 52S, strain harden more rapidly and the values given in Table III may have to be reduced by as much as 10 per cent for the first draw and 5 per cent for each succeeding draw.

Because the metal has a tendency to thicken as it converges toward the die in the drawing operation, there must be a slightly greater clearance between the punch and the die than the thickness of the blank. The space between the punch and die should be about one and one-tenth times the metal thickness. In successive circular draws, this space must be increased slightly; in final rectangular draws, the clearance is kept the same as the blank thickness.

The shape of the finished object naturally determines the shape of the starting blank. It must be carefully calculated to allow just the right amount of metal to flow into the shape of the final shell. The area and gage of the starting blank are changed very little by drawing, although the metal is "plastically rearranged," as shown by the slight change in the area of the squares shown on shells in Fig. 3 and 4. Drawn shells are usually rectangular, cylindrical or hemispherical, although odd shapes may also be drawn.

Thinner gages of metal have a tendency to wrinkle when drawn into dome or hemispherical shapes. To avoid such wrinkles in shapes made with one draw, the ratio of the inside diameter of the drawn shell to the original metal thickness should be kept below 200. When two draws are used, the shell should have sufficient metal at the proper positions to prevent fracturing or wrinkling in the final draw.

In a rectangular draw, greatest flow of metal occurs at the corners. To avoid both wrinkling and fracture, the draw radius at the corners must be slightly greater than at the sides and ends. Hollowing out the face of the blankholder will provide the necessary clearance between the die face and blankholder to take up the increase in metal thickness that causes the resistance to the metal flow. If this clearance is greater than the increase in metal thickness, buckles extending radially from the corners will form.

Since the metal moves the same in all parts of a symmetrical shape, cylindrical drawn shells require no allowance in any part of the tool for thickening of the metal. Die dimensions for drawing rectangular and cylindrical shapes are given in Tables IV and V.

Since aluminum has a tendency to gall

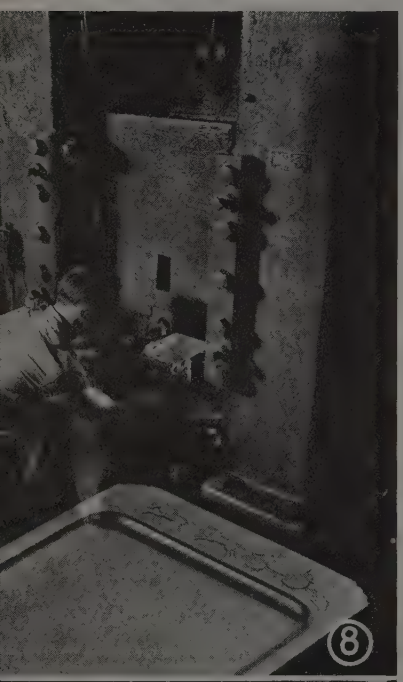
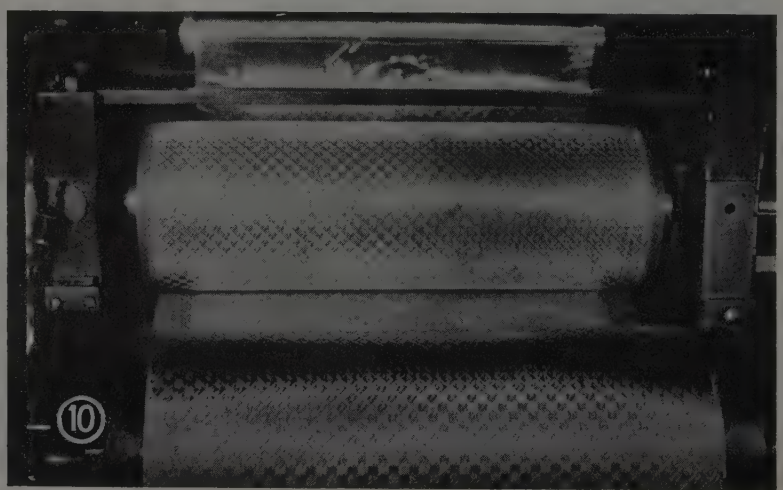




Fig. 8—Semi-coining aluminum alloy tray on 800-ton knuckle press. This is combination of embossing and coining

Fig. 9—Stamping brewer's name on upper half of drawn aluminum alloy beer barrel in a hydraulic press. Design is in sharp relief on end of steel punch; smooth anvil supports work

Fig. 10—Punch used in embossing of aluminum foil may be in shape of roll, design raised on periphery. Die is steel contact roll faced with smooth rubber



MESTA

HIGHER SPEED Four-High Tandem COLD MILLS



48" Four-High Five Stand Tandem Cold Mill

54" Four-High Four Stand Tandem Cold Mill

First in the industry with the Four-High Tandem Cold Tin Mill, Mesta has constantly maintained its position of leadership, and is building mills with delivery speeds which yesterday were considered impossible. These mills feature new types of drives and control systems which maintain synchronization during acceleration, deceleration and at normal operating speeds.

TABLE I

CAPACITY OF PRESSES USED FOR DRAWING VARIOUS BLANKS

Type of Press	Capacity, tons	Maximum diameter of shell, inches	Maximum thickness of blanks, inches	Maximum depth of draw, inches
Double-action toggle	63	8-7/8	0.051	4-3/4
Double-action toggle	125	14	0.102	8-1/2
Double-action toggle	148	15-1/2	0.102	9-1/2
Double-action toggle	282	23	0.125	10
Double-action toggle	300	27	0.125	10
Double-action toggle	360	25	0.125	14-1/2
Double-action toggle	400	30	0.156	12
Double-action toggle	550	30	0.187	17
Double-action toggle	500	37	0.250	14
Hydraulic	1300	49	0.3125	24

TABLE II

TYPICAL MECHANICAL PROPERTIES AND COMPOSITION OF ALUMINUM ALLOYS

Alloy & Temper	Ultimate Strength Lbs. per Sq. Inch	Yield[1] Strength Lbs. per Sq. Inch	Elongation % in 2"	Brinell Hardness	Composition[2] Si	Mn	Mg	Cr	Cu
2S-O	13,000	5,000	35.0	23					
2S-1/4H	15,000	13,000	12.0	28					
2S-1/2H	17,000	14,000	9.0	32					
2S-H	24,000	21,000	5.0	44					
3S-O	16,000	6,000	30.0	28		1.2			
3S-1/4H	18,000	15,000	10.0	35					
3S-1/2H	21,000	18,000	8.0	40					
3S-H	29,000	25,000	4.0	55					
52S-O	29,000	14,000	25.0	45			2.5	0.25	
52S-1/4H	34,000	26,000	12.0	62					
52S-1/2H	37,000	29,000	10.0	67					
52S-H	41,000	36,000	7.0	85					
Alclad 14S-O	25,000	10,000	21.0	..	0.8	0.8	0.4		4.4
Alclad 14S-W	59,000	38,000	18.0	..					
Alclad 14S-T	65,000	58,000	9.0						
24S-O	27,000	11,000	19.0	42		0.6	1.5		4.5
24S-T	68,000	46,000	19.0	120					
Alclad 24S-O	27,000	11,000	19.0	..					
Alclad 24S-T	64,000[3]	43,000[3]	18.0						
61S-O	18,000	8,000	22.0	30	0.6		1.0	0.25	0.25
61S-W	35,000	21,000	22.0	65					
61S-T	45,000	39,000	12.0	95					
Alclad 75S-O	32,000	14,000	16.0	..		0.2	2.5	0.3	1.6
Alclad 75S-T	76,000	66,000	11.0	..		(Zinc 5.6)			

[1] Offset 0.2 per cent.
[2] Per cent alloying elements. Aluminum and normal impurities constitute remainder.
[3] Sheet over 0.064-in. thick will have slightly higher tensile and yield strengths.

TABLE IV

DIE DIMENSIONS FOR DRAWING RECTANGULAR SHAPES

First draw	Add 2.2 times blank thickness to punch dimension
Second draw	Add 2.2 times blank thickness to punch dimension
Final draw	Add 2.0 times blank thickness to punch dimension

TABLE V

DIE DIMENSIONS FOR DRAWING CYLINDRICAL SHAPES

First draw	Punch diameter plus 2.2 times thickness of blank
Second draw	Punch diameter plus 2.3 times thickness of blank
Third and succeeding draws	Punch diameter plus 2.4 times thickness of blank
Final draw of tapered shells	Punch diameter plus 2.0 times thickness of blank

and scratch against steel, it is desirable to keep the tools well polished and suitably lubricated. Drawing also requires the stock to be well lubricated. The lubricant permits the blank to slip between the blankholder and the die without scratching and galling while the movement takes place. To prevent scratching, cast iron and low carbon steel tools require a heavier lubricant than hardened steel. Mineral oils or compounded mineral oils are the best, while water soluble compounds have been found less satisfactory. In general, for light draws use light oil; for medium draws use a mixture of light and heavy oils; for severe draws use heavy oil, or a 50-50 per cent mixture of mutton tallow and paraffin; and for very severe draws, a mixture of 30 per cent mutton tallow and 70 per cent paraffin mixture is best.

Forming by stretching gives aluminum sheet a permanent set by gripping it tightly at the edges while it is being deformed by the action of the punch. Simple stretching is applicable to shapes which have shallow curved contours, or at most a deep contour in only one direction.

Stretching may be done with a stretching die in a regular double-action press, as shown in Fig. 5, or on the stretch press using only a punch, or form. The position of the usual punch and die may also be reversed when using the double-action press with the stretching die. In this operation the form moves into the die, thereby stretching the sheet which has been fastened by flanges at opposite ends.

Compressed air clamps hold the metal down against the form in the stretch press. As the form rises, it comes in contact with the metal and stretches the sheet to the contour of the form. Wood, cast Zn, or wood covered with metal can be economically used in the form since there is no excessive wear on it. Tapered parts may be stretched by raising or tilting the stretch press table at an angle. This press, capable of accommodating one or several forms at once, can produce extra-size pieces that few draw presses could handle and double curvature shapes that are almost impossible to form by any other method. Lubricating either the form or the work with light oil is necessary to keep the work smooth.

TABLE III

REDUCTION IN DIAMETER FOR DEEP SHELLS

Operation	Desired Reduction Per Cent	Permissible Reduction Per Cent
Blank (D)		
First Draw (D1)	40 (or less) D	42D
Second Draw (D2)	20D1	25D1
Third Draw (D3)	15D2	18D2
Fourth Draw (D4)	15D3	15D3

Stamping, embossing, and coining are three compression operations which are done on single action presses and precision dies. These operations are used for strengthening, decorating, graduating and marking fabricated aluminum articles.

In stamping, shown in Fig. 9, the design is stamp cut into the metal and shows only on one side, leaving the surface otherwise flat. Lettering, figures, and the plainest sort of decorations are produced by this method. Either single action or horn presses are used, and the punch is constructed of hardened steel. The design which appears in sharp relief on the end of the punch has narrow rather than broad faced lines to displace as little metal as possible. Shims are used under the stamp to regulate the depth of penetration. A smooth anvil of mild steel is usually used to support the work. The tool may also be in the form of a roller that rotates in a marking machine and flat stamps the metal. For stamping cylindrical work, rollers on a lathe may be pressed against the article while it is revolving.

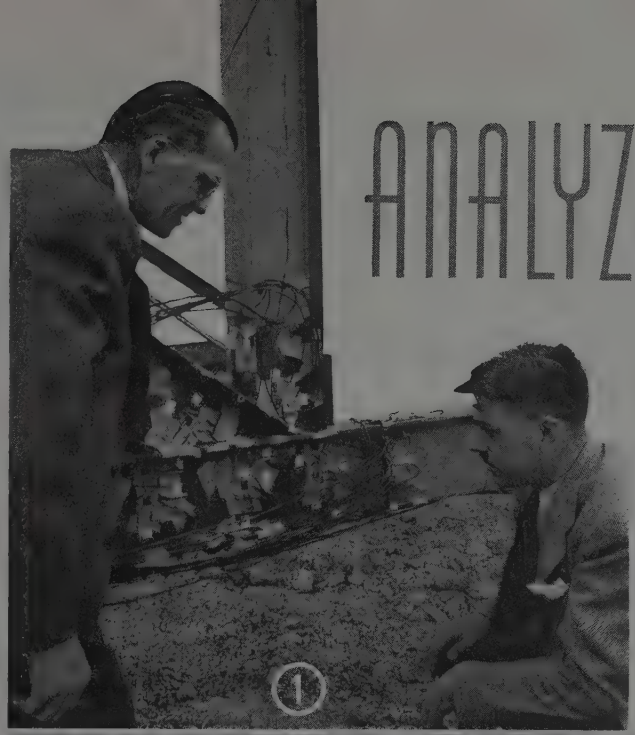
In embossing, the design is raised on the metal and has rounded rather than sharp edges as illustrated in Figs. 7 and

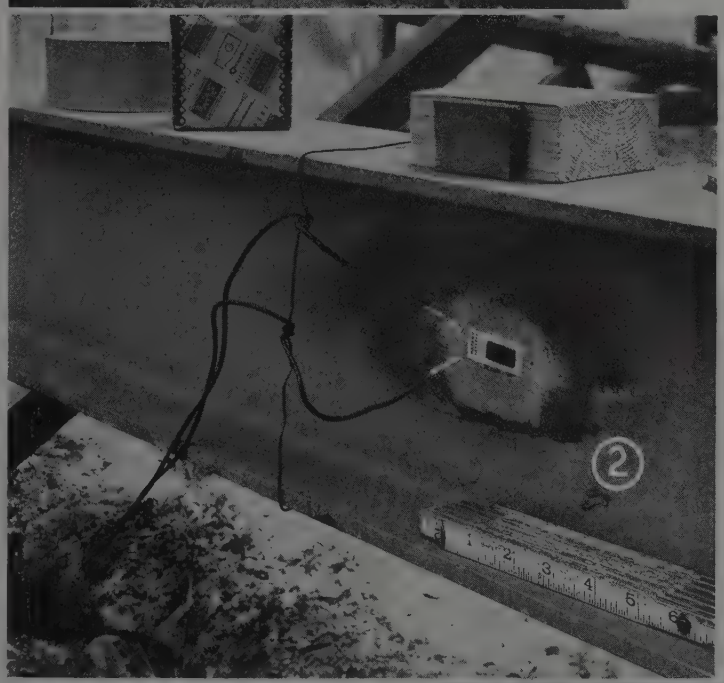
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ANALYZING STRESSES

IN WELDED H-SECTION TRUSSES

Strain gages consisting of tiny loops of copper nickel wire located at 48 points on two 80-ft trusses measure strains to one millionth of an inch. Electronic equipment amplifies readings for conventional recording devices





SOUNDNESS of present design methods used on H-section long-span trusses of unusual framing were confirmed recently by a series of strain tests conducted on two 80-ft trusses from the fabricating stock of The Austin Co., Cleveland. The latest studies directed by H. D. Churchill, professor of engineering mechanics at Case School of Applied Science, revealed in detail how stresses flow through welded truss joints.

Fabricated completely from rolled members cut to the desired length and assembled with their webs in a single vertical plane, the H-section trusses were originally designed in 1943 and tested to destruction in 1944. Under a load which was 253 per cent of the design load, the 50-ft trusses used in the initial test failed when an end vertical buckled.

In the most recent tests, SR-4 strain gages were attached to the joints at both ends of the first diagonal and at certain other important points. They were placed at the same locations on both trusses to provide a check.

The strain gages designed by Baldwin Locomotive Works make it possible to

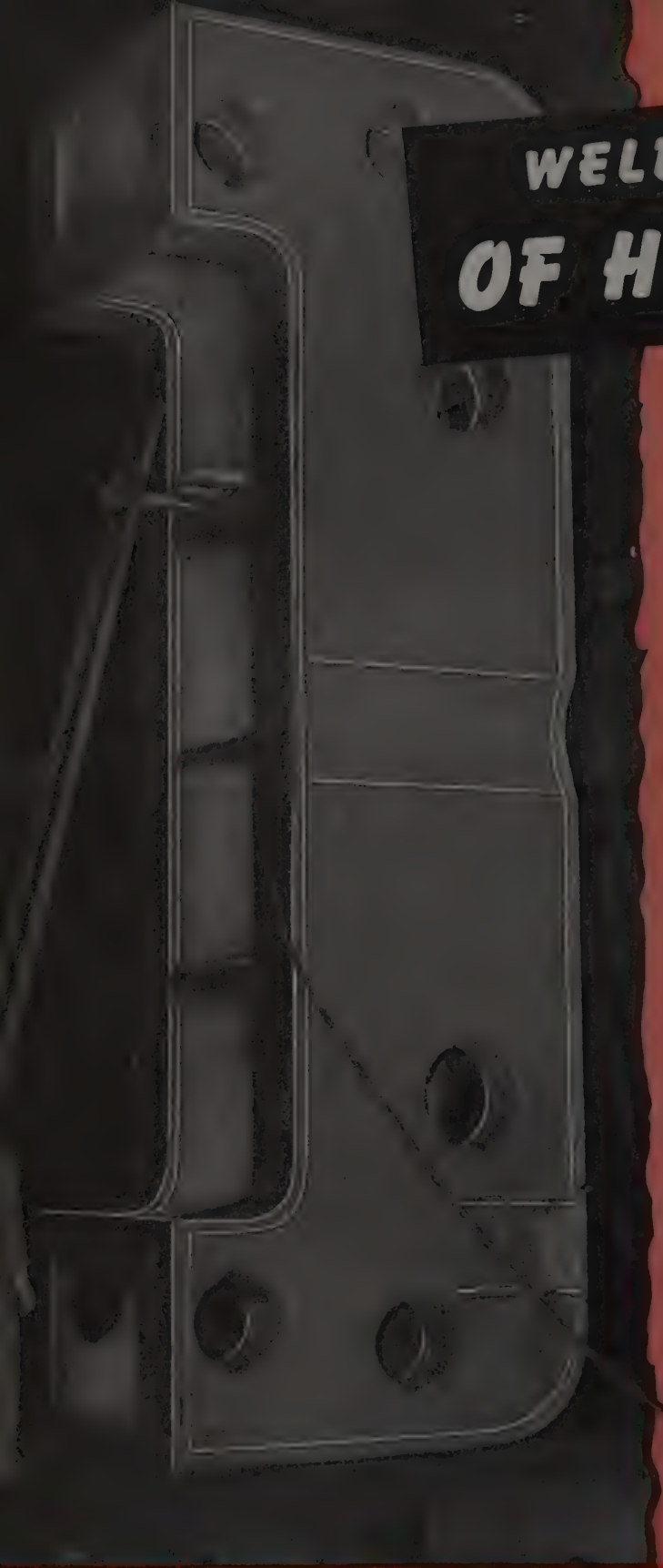
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Fig. 1—H. D. Churchill, left of Case School of Applied Science, and A. T. Waidelich of The Austin Co., Cleveland, inspect strain gages

Fig. 2—Closeup of strain gage cemented 80-ft truss. Fine wires which actually measure strains are concealed behind small piece of felt

Fig. 3—Electronic equipment amplifies readings for these conventional scanning instruments





WELDING with an eye t
OF HEAVY PRESS

Up-to-date facilities and men trained to meet exacting standards of precision, make the fabricating and machining of large structure weldments standard production at Danly.

The mechanical press crown *left* brought no problem of size to Danly engineers and setup men. Sub-assembly construction permitted several crews to work on the components at the same time. This method cut much costly handling time—avoided inaccuracies in dimension and distortion which frequently occurs in welding of large structures.

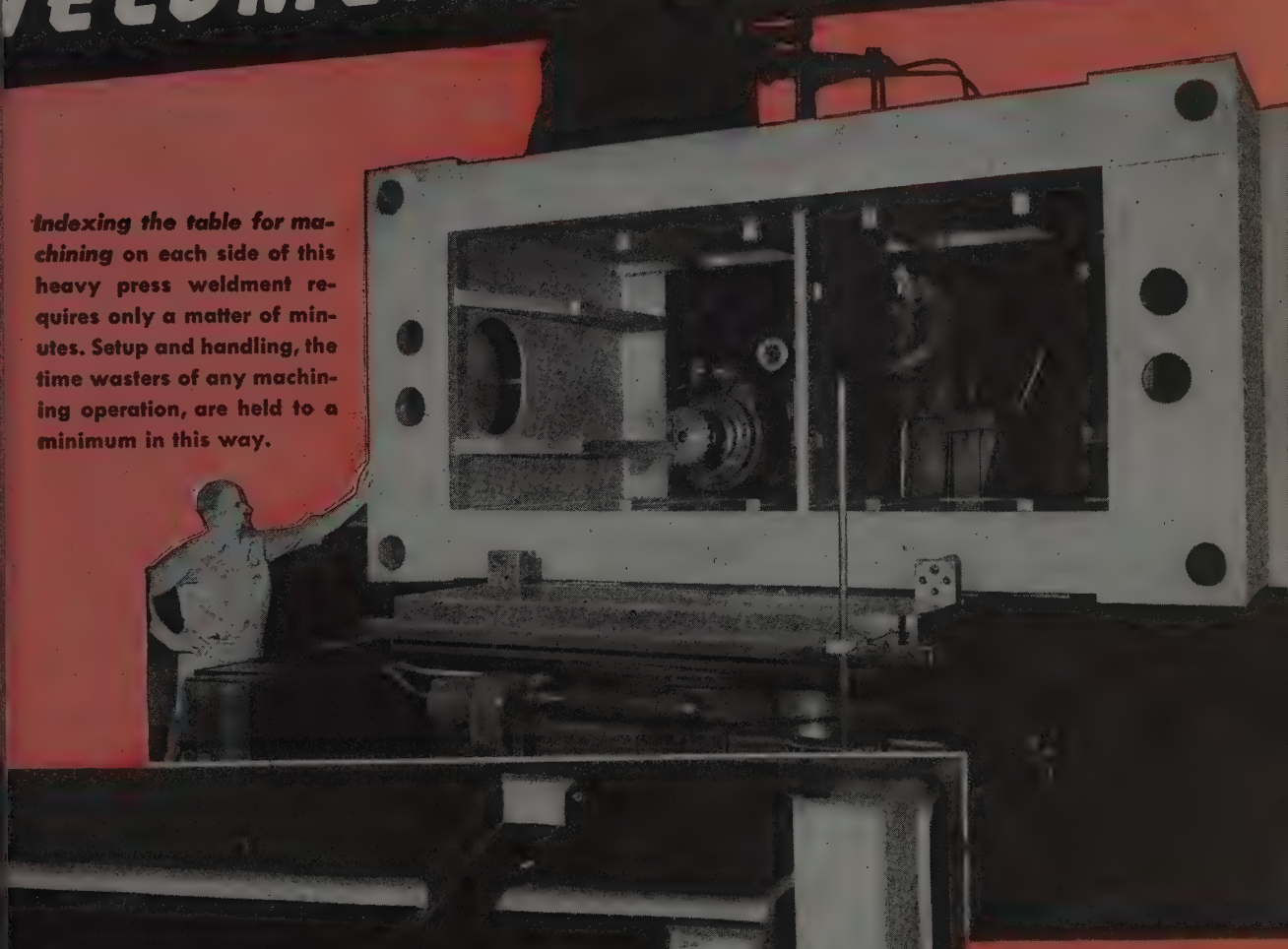
Floor type boring mills *like the one shown at right* simplify exacting machine work. The horizontal indexing table makes it possible to machine each side of the press bed with but a few minutes to index the table and resume work on the next surface. The right-angle boring head *inset* makes possible complete internal milling and boring at any angle through 360 degrees.

DANLYWELD

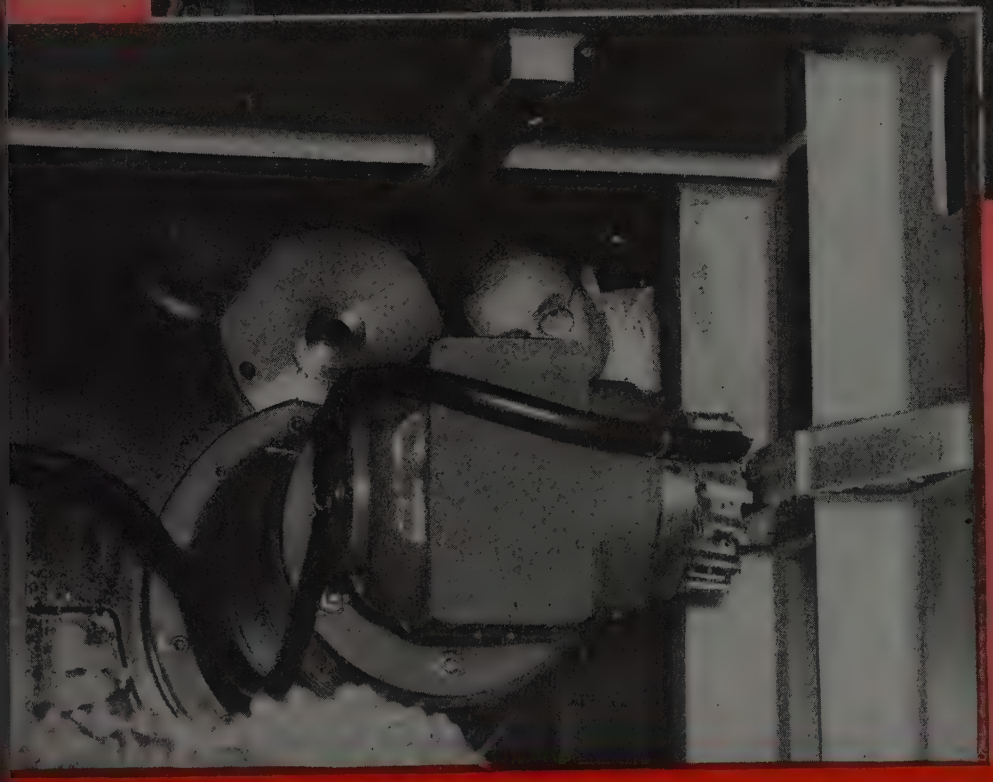
Welded and Machined
at Lower Final Cost

ANLY MACHIN

ACHINING
VELDMENTS BY DANLY

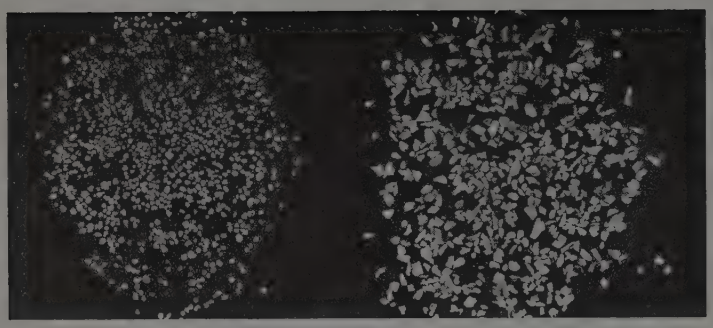


Indexing the table for machining **on each side of this heavy press weldment requires only a matter of minutes. Setup and handling, the time wasters of any machining operation, are held to a minimum in this way.**



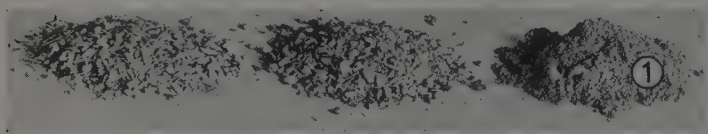
This right-angle boring he
runs into deep wells and
teriors for machining on s
faces like the side cush
guides on the press b
shown here. **Complete inter**
milling at any angle is po
ble in one setup.

SPECIALTIES, INC



By E. C. LATHROP
and
S. I. ARONOVSKY
North Regional Research Laboratory
U. S. Department of Agriculture
Peoria, Ill.

SOFT-GRIT BLASTING



Standard sand-blasting equipment effective in cleaning metal surfaces, whether to remove carbon deposits, dirt, paint, varnish or lacquer. Original dimensions not altered





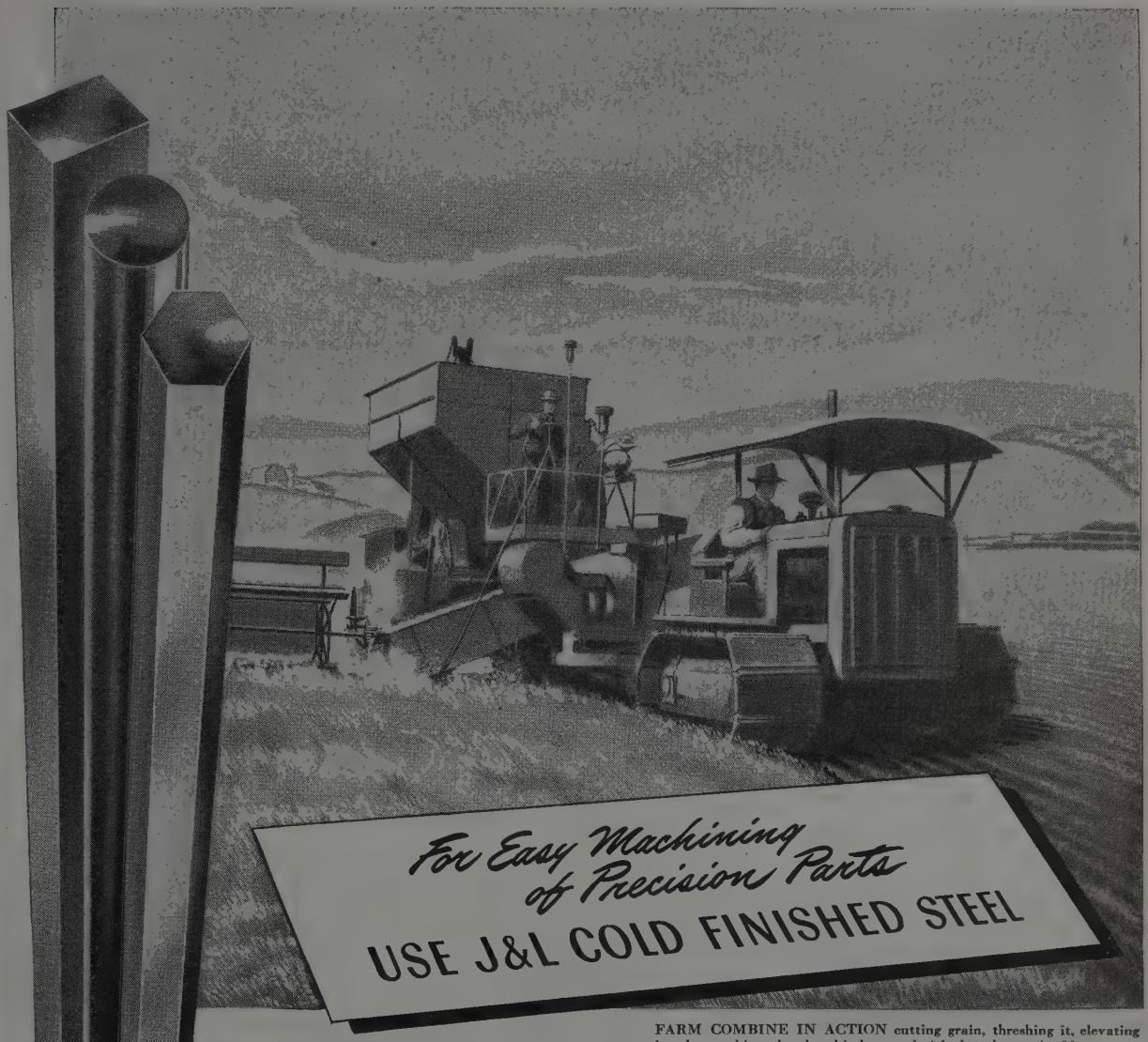
REMOVING hard, thick carbon deposits from cylinders and pistons of aircraft engines by "soft-grit" blasting has become standard practice at many of the United States naval air stations and Army overhaul depots. This method has resulted in considerable savings in manhours, making it possible to clean from four to ten times as many parts in an 8 hour day as by the older methods. The process is almost fool-proof, since properly chosen soft grits do not change the dimensions of the objects, and no masking or hand tools are required. Careless and unskilled operators using the old means of scraping, turning on lathes, and sand-blasting, were responsible for the damage to many pistons and parts that sent them to the scrap heap.

By the "soft-grit" method, pistons, cylinders, etc., are first degreased and are then cleaned in a blasting cabinet with corncob or similar grit under 80 to 90 psi air pressure. Fine dust and dirt are blown to a collector and the grits are recirculated until worked out. Standard sand-blasting equipment has proved entirely satisfactory for handling soft-grit materials, but the naval air stations state that the pressure-blast type is preferred to the induction-blast type.

Early in the war, when soft-grit blasting was being developed, food or feed such as wheat, hominy grits, clover seed, and the like was pressed into service. However, owing to presence of tetraethyl lead in the carbon, waste from the process was unsuitable for either feed or fermentation purposes. About that time the Army overhaul depots began to use ground nut shells and cellulose-acetate pellets, but there was a shortage of nut shells, which came mainly from the Pacific coast, while the plastic pellets were quite expensive.

The Bureau of Aeronautics of the Navy then appealed to the U. S. Department of Agriculture for help in locating a cheap, nonfood, soft-grit blasting material that would be obtainable in large volume. As a result, the Northern Regional Research Laboratory, Peoria, Ill., (one of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, Department of Agriculture) began to work directly with the Assembly and Repair Department of the Naval Air Station, Norfolk, Va., and introduced the use of specially ground corncobs and rice hulls. These materials, after considering such factors as availability, first cost, total period of usefulness, and operating efficiency, were the most satisfactory ones that had yet been found and were adopted as standard by the Bureau of Aeronautics of the Navy. The specifications call for corncobs ground to pass a 10-mesh screen and to be retained by a 32-mesh screen (Tyler screen series). Chaff and pith particles shall be practically absent. Not more than 13 per cent moisture may be present in the cobs.

Corncobs from hybrid seed-corn operations are the most suitable for the purpose because they are dried during the preparation of the seed. They grind



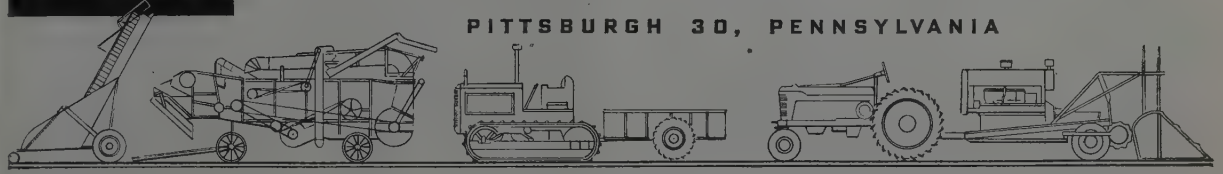
FARM COMBINE IN ACTION cutting grain, threshing it, elevating it to hopper bin to be placed in bags and picked up by truck. Many parts of Cold Finished steel are used in both tractors and combines, without which machinery today's great harvests would be impossible.

Experience and proper equipment are indispensable in the production of steels for cold working. At J&L the steel used in cold finishing operations is specially selected to be cold drawn, turned and ground, turned and polished or cold rolled. This is one reason why J&L Cold Finished steel is easy to machine, why you have fewer tool changes when making parts for agricultural implements, automobiles, home appliances and business machines. Write for information.

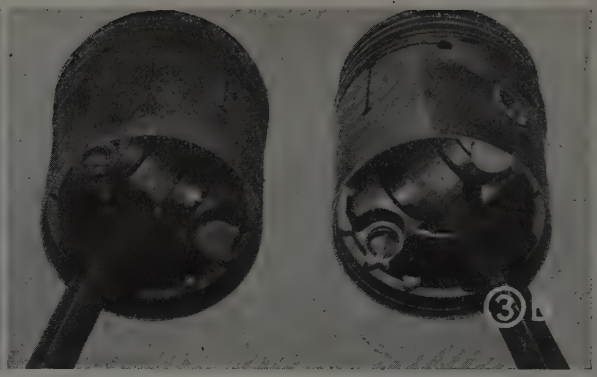
J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA







best at about 8 to 10 per cent moisture content, but are first crushed to pass a ¼-½-in. mesh screen. Then they are ground by an attrition or cutter-type mill to meet the screen specifications. The light pith or beeswing material must be separated from the soft grits by an air blast, and a yield of 50 to 60 per cent cob particles of acceptable size may be secured.

Ground corncobs clean airplane cylinders and pistons perfectly, with no change in dimensions and no pitting action. Because of their resilient character, dirt does not collect on the particles. Fig. 1 shows the relative size of soft grit of this kind before and after a 5-hour test conducted at the Norfolk Naval Air Base. The particles have shrunk about 50 per cent in volume, are free from dirt, and were still doing good work at the end of the test period.

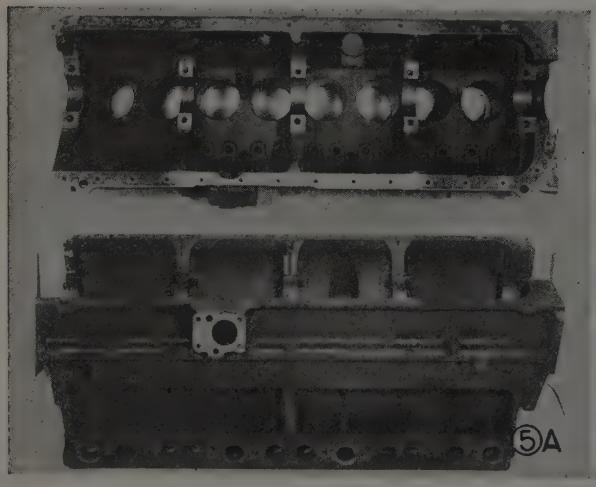
Rice hulls, a waste product of rice mills, may be used directly for blasting. It is not necessary to grind or crack them prior to application because the blasting process breaks them down without difficulty. The hulls contain about 18 per cent silica and are slightly abrasive to steel. They do not flow through the air gun as readily as does cob grit and have a much shorter service life. A mixture of about 60 per cent corncob particles and 40 per cent rice hulls flows easily, has a more rapid cleaning action than corncobs alone, and is now used to some extent by the naval air stations because it has been found to produce no measurable change in dimensions of cleaned parts.

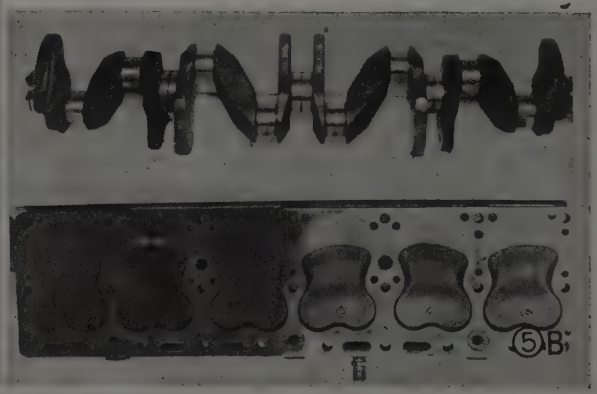
The engineers of the Bureau of Aeronautics have expressed the belief that many uses could be found for the soft-grit blasting process in the metal-fabricating or metal-cleaning industries, as well as in overhaul and repair shops. Using a standard booth loaned by the Navy to the Northern Laboratory, and working with some of the plants in Peoria, a number of the possibilities which exist in these fields have been explored and include the cleaning of automotive, air-compressor, and other machine parts; the removal of paint and finishes from metal surfaces, etc. The results obtained are shown in the accompanying series of illustrations numbered 2 to 8, inclusive.

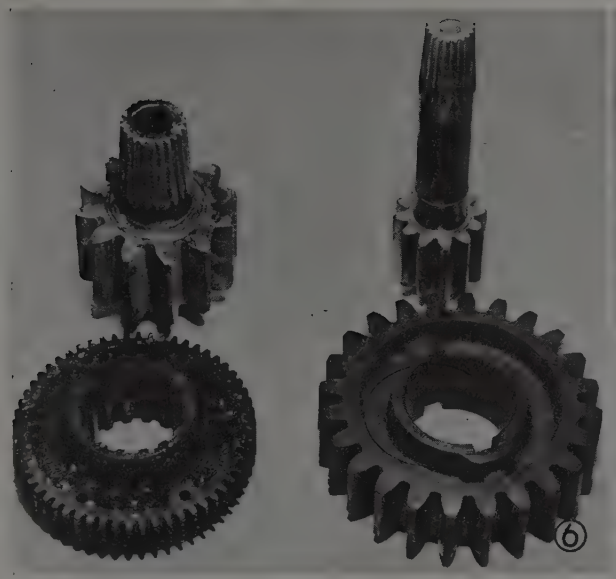
Automotive Parts: Fig. 2 is an aluminum piston from a diesel engine before and after it was cleaned with corncob grit and rice hulls, while Figs. 3A and 3B present two views of aluminum piston-steel connecting rod assemblies which give a good idea of the thoroughness with which soft-grit blasting cleans both the inside and the outside of these parts, as well as the piston rings and the ring grooves.

An engine block from an automobile that had run more than 100,000 miles and that had not been cleaned is shown in Fig. 5 with only the central section treated by the soft-grit method. Although the block was heavily encrusted (to a thickness of ¼ to ½-in. in some spots) with grease, carbon, oil, and dirt, the extraneous material was removed very rapidly, leaving a clean metal surface. However, the effectiveness of the corncob-rice hull mixture was reduced considerably by the very large









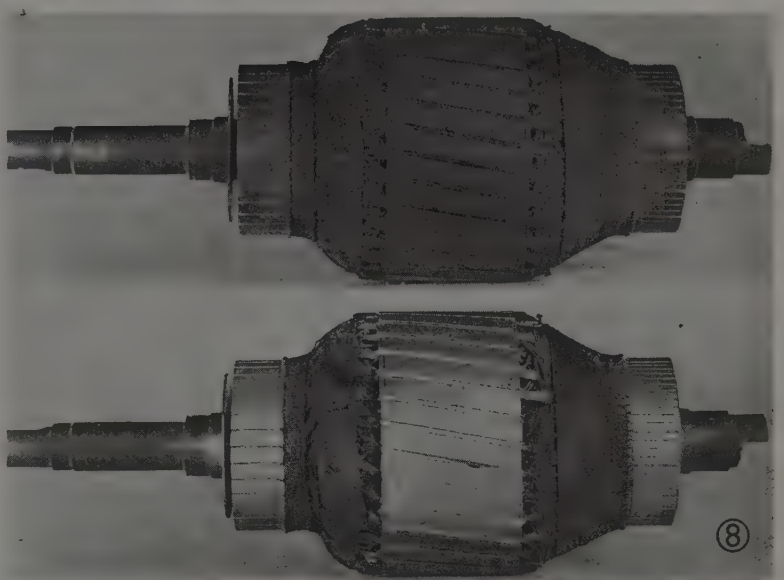


amount of grease and oil on the block. It is therefore recommended that, in cases of excessive accumulations, they be removed by wiping or by solvent action prior to blasting.

The effectiveness of the soft-grit method of cleaning crankshafts is shown in Fig. 5B. Contrast between the treated center and the untreated ends is quite sharp. The bearing surfaces were cleaned but not pitted by the soft grit. Fig. 5B, bottom view, demonstrates the action of corncob-rice hulls on a cast-iron engine head. Of particular interest in this instance is the fact that the spark plugs in the head were cleaned thoroughly without affecting the setting of the gap between the electrodes. The usual procedure of sand-blasting spark plugs removes some metal, pits the porcelain, and necessitates resetting of the points.

Machine Parts: Soft-grit cleaning of air-compressor parts is illustrated in Fig. 4. Heavily caked with carbon and dirt, the compressor valve assembly's left side gives even more striking evidence of the thoroughness of corncob-rice hull blasting, as on right. Less than 5 min were required to clean the part.

Gears and pinions in final stages of manufacture are pictured in Fig. 6. Those on the left are untreated and the others have been exposed to soft-grit blasting. In the case of the right-hand steel pinion at the top, the material not only completely removed the flaked tin with which pinion was coated but cleaned the inner threads; and from the right-hand gear at the bottom, which was carburized but not hardened, the process readily blasted scale, rust, and carburizing-bath residues. It should be stated at this point that soft grit will not entirely dispose of scale formed





in the hardening of steel, in which case it acts as an integral part of the metal surface.

Painted and Lacquered Parts: The removal from metal surfaces of paint, varnish and lacquer, even those with synthetic-resin bases, was easily accomplished by soft-grit blasting. This is well brought out by the panels in Fig. 7, the center section of each of which was not treated. The upper part was cleaned with corncobs alone; the lower with a corncob-rice hull mixture.

An interesting development in the use of soft grit is that in connection with motor armatures, as illustrated in Fig. 8. The iron core and the copper commutator rings were cleaned readily and apparently without affecting the metals. However, it is necessary to mask the wire insulation, which is not resistant to the blasting material. Fig. 9 shows blasting booth and dust collector used in the experiments described.

Rust and welding-scale removal by the process presents no difficulties, but an attempt to remove hard scale from drawn-steel wire so as to eliminate the pickling step prior to coating it with zinc was unsuccessful. This is because the hard scale acts as an integral part of the metal surface, and thus cannot be completely eliminated by soft-grit blasting.

Paint and varnish can be cleaned easily from wood surfaces with corncob-rice hulls. However, this method is not recommended because, in addition to disposing of the paint, the soft-grit tends to gouge out the soft spring wood more rapidly than it attacks the harder summer wood. The black and pink surface stains produced when brass is annealed can be removed by means of soft grit, but a frosted finish results.

Commercial Feasibility: It is quite apparent from these results that soft-grit blasting can be applied to advantage in many metal-using industries, in maintenance, repair, and manufacturing. The mechanical superintendents who witnessed the tests at the Northern Laboratory were surprised at the speed and ease of the cleaning process and were unanimous in their belief as to its practicability. Those concerned with overhaul and repair of diesel automotive equipment questioned only the cost of the blasting booths and dust collectors for a small shop. They expressed the opinion that the method held great promise not only for engine blocks, heads, pistons, and cylinders but also for many small parts such as spark plugs and for repaint jobs.

Companies in Ohio, Illinois, and Iowa are now equipped to grind corncobs to Navy specifications, and many others have expressed an interest in the business. The price of ground cobs in bulk, f.o.b mill, is in the neighborhood of $30 a ton. The rice millers in Arkansas, Louisiana, Texas, and California have found little use for the hulls, which should be available in bulk at the mill at approximately a third of the cost of the ground cob grits. Sand in bulk comes to about $10 to $12 per ton. The relative weights of these materials is given in an accompanying table. It will be seen that the soft grits have about 3.5 times the volume of sand. Sand and rice hulls both have a relatively short life in blasting operations, while corncobs have a very long service life. The cost of these materials in actual use may, however, not differ much.

There are doubtless many purposes for which sand and possibly shot are now employed where soft-grit blasting would do as good a job with greater safety, and there are many others for which neither sand nor shot may be used but for which soft grit is ideal. Soft grits are not recommended for removing mill scale and baked enamel, for smoothing castings, or for other operations requiring high abrasive or cutting action on metals. Except to a small extent, they do not act as polishing agents on hard metals, and they will not burnish. However, they do produce a smooth, non-pitted surface.

Soft-grit blasting is an established business of small proportions that has started to grow in a number of directions. A prominent manufacturer of blasting equipment has reported that the company is receiving inquiries concerning the availability of soft grits with increasing frequency. The tests have clearly indicated the national applicability of the method. Standard blasting equipment such as is to be found in large industrial establishments can be used, and requires no alterations. For the thousands of automobile, farm-machinery, and other repair shops in every city and village, there is need of simple booths and equipment to make the process attractive. Here is an opportunity for the designing, construction, and merchandising of low-cost booths, air compressors, air guns, and dust collectors or cyclones.

That is one side of the picture. Another is the small rural business man who is anxious to process farm wastes into useful products and to obtain more income. Soft-grit blasting gives him a chance to market thousands of tons of corncobs, rice hulls, and other farm wastes annually. And no less important is the opportunity it offers the handicapped service man to begin a modest and perhaps portable cleaning shop in a rural community. In short, the development of this branch of industry, energetically promoted by equipment manufacturers, can provide much new postwar employment.

Data and photos for this article were provided through the courtesy of the Compressed Air Magazine.

RELATIVE WEIGHTS OF GRITS

Blasting Material	Weight per cu ft
Rice hulls, ground	29.6 lb
Corncobs, ground to Navy specifications	28.4 lb
60 per cent corncob—40 per cent rice hull mixture, ground	28.8 lb
Blasting sand	100.0 lb

ACKNOWLEDGEMENT

The Northern Laboratory desires to acknowledge the co-operation of R. G. LeTourneau, Inc.; Caterpillar Tractor Company; Keystone Steel & Wire Company; Egolf Motors, Peoria, Ill.; The Bauer Bros. Company, Springfield, Ohio; Sprout, Waldron & Company, Muncy, Pa.; F. S. & W. Cob Products Company, Bloomington, Ill.; Lieut. Commander E. E. Gallahue, USNR, Production Branch, Office of Procurement and Material, Navy Department, Washington, D. C.; Lieut. Cloyd A. Snavely, Engineer Division, Assembly and Repair Department, Naval Air Station, Norfolk, Va.; and of others who have contributed to this development.

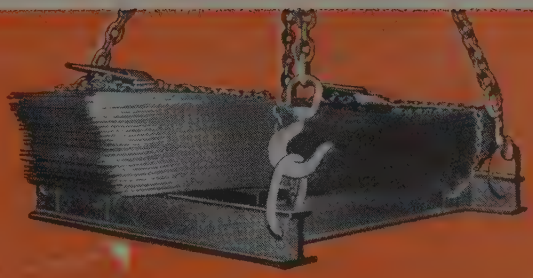
Naming of these firms should not be construed as an endorsement of them or their products by the U. S. Department of Agriculture. They are the companies which have aided the Northern Regional Research Laboratory in the work of developing and testing soft grit from agricultural residues.

Methods of Time Study

Time Study and Motion Economy, by Robert Lee Morrow; cloth, 338 pages, 6 x 9 inches; published by the Ronald Press Co., 15 East 26th St., New York, for $5.

This volume has been prepared for everyone who finds it important to know the fundamentals and advanced techniques of time study and motion economy. It covers all essentials of time study and motion economy, presentation following from the author's consulting and training experience. With return of industry to competitive production the need for such studies is evident to manufacturers. An important new field is in smaller plants. Many plants with less than 100 workers which operated as subcontractors during the war were greatly aided by advice and direction of their prime contractors' time study and methods men. This book is intended to help them adopt without undue expense the standard tasks and wage incentives they must have to compete successfully with well-established companies in their respective fields.





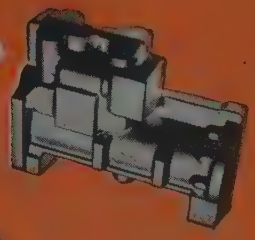


in daily use

in all common forms

Whatever your needs may be, there's an available magnesium form for every standard purpose. Like other firms throughout the country, you'll find it pays to adapt magnesium's lightness, strength, machinability to the job of cutting costs and improving products in your own field.

Today magnesium alloys are freely available in all common forms—ingots and billets; sand, permanent mold, and die castings; forgings; extruded bars, rods, shapes, and tubing; and rolled sheet, plate, and strip. Commercially pure magnesium and such special products as welding rod, protective agents, fluxes, and special alloys are also readily available. As the pioneer producer and leading fabricator, Dow offers complete technical data and assistance in working and fabricating magnesium. Simply contact the nearest Dow office.





Ready . . . to make products move!

MAGNESIUM

LIGHTEST OF ALL STRUCTURAL METALS



Die casting magnesium is an accepted method of producing lightweight parts with good surfaces and close dimensional tolerances.



Preheated magnesium sheet is readily deep drawn in a single operation, without need for repeated annealing and redrawing.

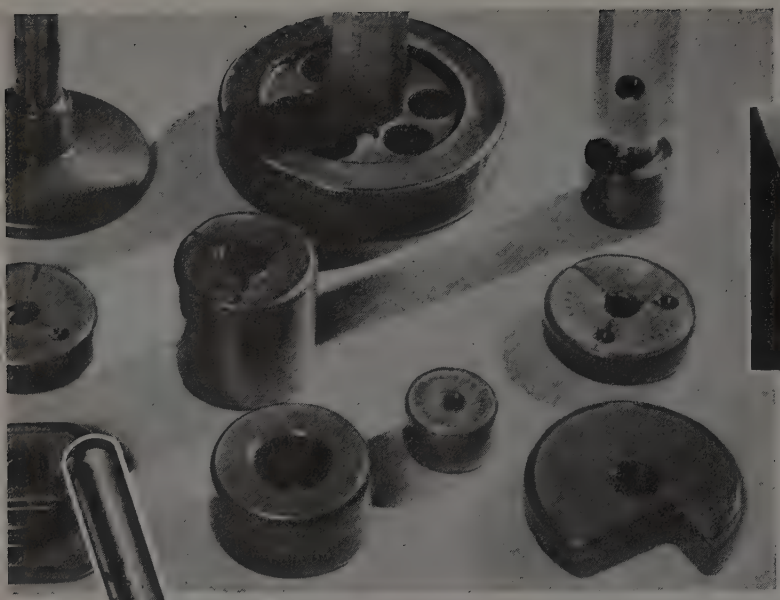


Sand and permanent mold castings of magnesium are known for their exceptional combination of lightness, soundness, strength.



MAGNESIUM DIVISION • THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle

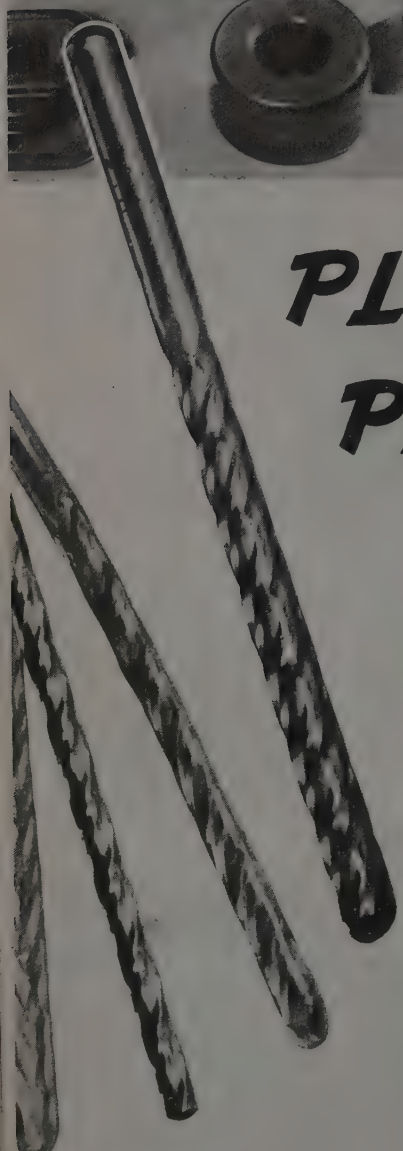




Left — Packaged in transparent plastic coating, these parts are ready for shipment or storage

Above — Like peeling a tangerine coating is removed quickly and easily as shown here

PLASTIC PACKAGING for metal parts



Above — Protective plastic is partially removed on drill at left

WAR-BORN plastic dip packaging process originally used by the armed forces to protect precision tools, gages and parts against shock, corrosion, rust and scratches during overseas shipment is now available for shipment and storage of various industrial products. Process described as "simple as dunking a doughnut" uses plastic formulation called Seal-Peel, made by Seal-Peel Inc., Detroit.

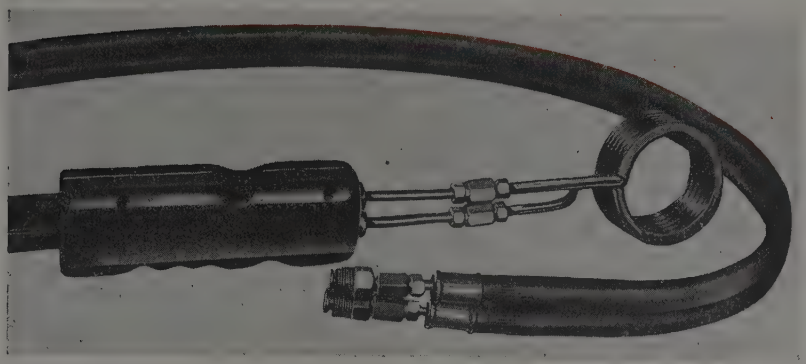
Product in solid form—50-lb blocks to large users—is melted in pots furnished and installed by the company. Metal parts are dipped and withdrawn, and in a matter of seconds plastic dries and hardens into a thin, tough, brownish transparent coating. Immediately, or 10 years later part can be unpackaged simply by peeling coating; plastic exudes a fine film of oil over the metal part making it ready for instant installation. Packaging costs and shipping bulk are said to be reduced as much as two-thirds.

Auto makers now can make complete runs of service parts simultaneously as they produce the car, and store them for years. At any time parts can be shipped to points around the globe without the hazard of corrosion.

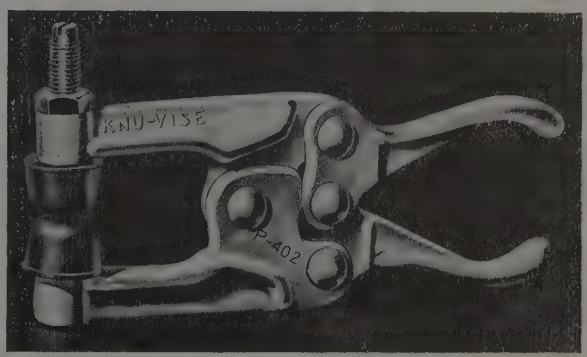
According to the company, new product withstands pressures up to 600 psi and temperatures ranging from 120° below to 160° above zero. Resistance to shock was demonstrated by Seal-Peel processed jars of jelly which remained intact after having been tossed from roof top to concrete pavement.

Plant laboratory has perfected a tough, water-clear, non-inflammable, cold plastic coating. Non-toxic and moisture proof, this will be available soon in colors; it can be produced in sheets and heat-sealed. Another research problem is an oil-less dip coating, flexible, moisture-proof with good electrical resistance—to be applied at low temperature.

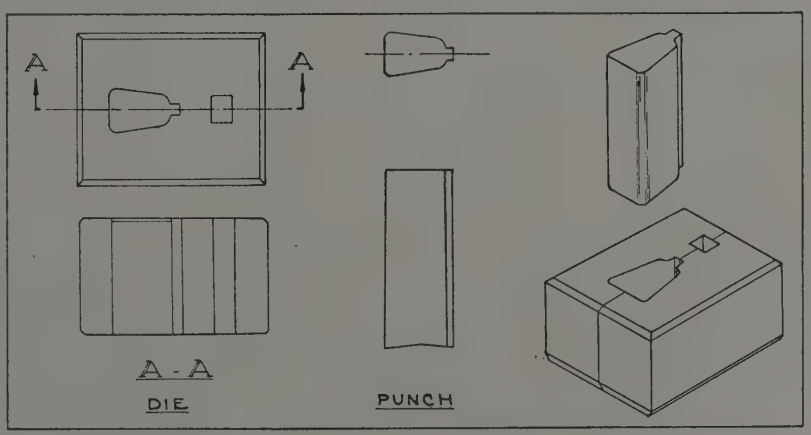
Portable Induction Heating . . .



Flexibility of movement is provided for induction heating coil, shown in the accompanying illustration, by mounting the heating coil on grip type handle which is connected to a transformer by flexible leads, allowing coil to be taken to the work. Developed by Induction Heating Corp., New York, equipment is used for both heat treating and brazing. At present, it is said, coil is being used successfully for annealing ends of large shafts and for brazing of large, tubular steel assemblies

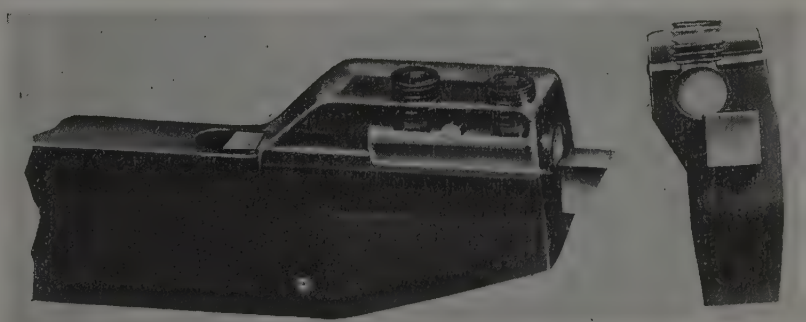


PLIERS FOR LIMITED SPACE: Designed for welding, drilling, riveting and similar operations, these toggle pliers made by Knu-Vise Inc., Detroit, provide a pressure of 400 lb on work when normal 40-lb hand pressure is applied. Pressure spindle has screwdriver slot to facilitate adjustment. Pressure pad is shaped so rubber cap is secure, and flat base does not mar work



CEMENTED CARBIDE DIES: In the manufacture of abrasive silicon steel stator laminations for electric motors, O'Keefe & Merritt Mfg. Co., Los Angeles, is using punches and dies of solid Grade 55B Carboloy, said to increase punch and die life fifty-fold, and eliminate burring of blanked metal. Operating without lubricant at speeds up to 600 strokes per minute, dies, shown in drawings, are made in two pieces and clamped together. Die is sharpened by grinding metal off top. The Carboloy is a shock resisting carbide in general use for blanking work

NEW TOOL HOLDER DESIGN: Utilizing a clamping pin which engages cutting bit, this new tool designed by Cooper-Bessemer Corp., Mt. Vernon, O., locks bit with a vise-like grip. Dowel holds clamping pin in position for inserting tool and set screws hold pin. Tool bit is held rigidly in both vertical and horizontal planes, making holder suitable for carbide-tipped bits



Behavior of Various Types of

Open-Hearth Bottoms

By R. B. SNOW
Research Laboratory
United States Steel Corp.
Kearny, N. J.

Sintered-in double-burned dolomite hearth or sintered-in bottom with little silica, high magnesia and free of lime affords improved practice. Use of chrome brick beneath working surface recommended because of nonhydrating property. Optimum performance obtained when sintered magnesite surface is 50 per cent of total hearth thickness

FULLY rammed bottoms of the 60 to 65 per cent MgO type, toward the end of the war were, in many instances, surfaced with a sintered layer of a magnesite-slag mixture. More recently some hearths have been installed using rammed material of the 80 per cent MgO type and others of sintered magnesite plus slag on top of a sub-hearth of plastic chrome ore, or of rammed 80 per cent MgO material.

Drilling of hearths which had been in service has shown that within 6 months, more than two-thirds of the magnesite had been eroded from the flat of magnesite-slag bottoms; a similar result was observed on a fully rammed bottom of the 80 per cent MgO type, though it was reported as having a good flat but poor banks. One sintered magnesite bottom showed a saving of 17 min per heat over the shop average during the first 281 heats; a second showed no lost time during the first 105 heats. In the bottoms prepared from the 60 to 65 per cent MgO material roughly one-third to one-half of the original material was intact and relatively unaltered after 6 months to a year of the furnace campaign, but the lost time on these furnaces was usually greater than had been expected. In the first two such furnaces drilled, the rammed material on the flat had been completely replaced, but later work indicated that this was not the general condition. In some shops, surfacing the rammed material with a magnesite-slag mixture apparently lessened lost-time delays, but about two-thirds to one-half of the original material had been either altered or replaced during the following 6 months to a year. Two bottoms drilled, one after 3½ and again after 4½ years, and the other after 4 years, showed that even the plastic chrome ore sub-hearths had been removed; yet these furnaces were stated to be doing as well as the rest of the shop.

The first magnesite slag bottom and the 80 per cent MgO type bottom referred to previously were reported as being satisfactory by the respective operators and each was amazed to learn that the material had been largely eroded from the flat. These furnaces were taken off without resurfacing because of the scarcity of oil in the fall of 1945. A considerable thickness of relatively unaltered original material was found in that portion of the bottom which is below, and protected by, the banks.

Upon the installation of a new hearth the operator hopes always to eliminate bottom troubles such as boils or forced taps. On the other hand, as soon as the furnace is operated corrosion begins, and the average furnace crew seems to believe that no maintenance is needed and they do little except normal fettling. Lost-time records for two different rammed bottoms in the same shop indicate that little trouble was encountered during the first month of the campaign, but by the end of the second or third month the lost time record was only slightly better than that of the rest of the shop. Operators in the past have probably paid little attention to the precise level of the bottom because they have believed that a furnace cannot be drained if the surface is 6 in. low; yet it has been found that the surface of a hearth after the first campaign may have been eroded to almost twice this depth.

During the second campaign the operator looks at the record and points

Rammed Magnesite Bottoms

By J. J. GOLDEN
Division Superintendent Steel Production
Carnegie-Illinois Steel Corp.
. . Gary, Ind. . .

ELEVEN bottoms were replaced at Gary No. 4 open-hearth shop in 1943, three others having been built in 1939 and 1940 with 6 in. of rammed chrome base material surfaced with 13 to 14 in. of sintered magnesite. It was originally planned to install 18-in. rammed bottoms, but delays cut this to four. Three bottoms were surfaced with 3 in. of sintered grain magnesite mixed with 15 per cent of crushed, clean basic slag. The remaining four bottoms were surfaced with finely sized magnesite mixed with 10 per cent of clean, basic slag, crushed to rice size.

Average delay per heat on the 100 per cent rammed bottoms, 27.4 min, is appreciably higher than on those bottoms surfaced with sized magnesite, 23.0 min per heat, or on the bottoms surfaced with grain magnesite, 20.9 min per heat. The delays on the four furnaces surfaced with sized magnesite vary from a high of 28.9 min per heat to a low of 14.1 min per heat. The bottom with the thickest surfacing, 6 in. had the fewest delays, while the bottom with the least surfacing, 3 in. had the most delays.

In May 1945, a new bottom was installed in No. 3 shop with 11 in. of sized magnesite sintered in with 10 per cent of clean, basic slag over a sub-hearth of rammed chrome-base plastic material. Sintering took slightly over 100 hours. The delays over 8 months for the furnace averaged 8.9 min. per heat.

Based on experience at Gary, it is believed that optimum performance will be obtained with a bottom that has a sintered magnesite surface of at least 50 per cent of the total hearth thickness. Likewise, it is felt that the normal bottom life should be considered approximately 10 years instead of the 20 years minimum formerly considered as standard for good steelmaking practice.

out that although there have been a few holes, the bottom is not solid steel. Drill cores show, to the contrary, that within 6 months to a year there may be as much as 8 in. of steel in the bottom, perhaps not end to end but in large masses. Most of the bottom, by then, is so much altered that its composition, by chemical analysis, is that of a typical surface layer, that is, it is more like slag containing some magnesite than magnesite containing some slag, particularly in relation to the wearing of the banks and the center portion of the flat between Nos. 2 and 4 doors on a 5-door furnace.

No bottom to date has been entirely satisfactory but some have been better than others. It is believed that the record of any bottom examined can be matched, or improved upon, by either a sintered-in double-burned dolomite bottom, or a sintered-in bottom containing extremely little silica and relatively high magnesia but no free lime; each material should be grain sized in order that the bank and bottom be dense.

Some shops troubled with continuously high bottoms can undoubtedly use a partially rammed, perhaps even a fully rammed bottom, to advantage, because the delays are caused by holes in the troublesome lime layer rather than in the original material of the bottom. A shop in which the grade of steel is corrosive of the bottom may find that a sintered bottom gives less lost time delay in the initial year of operation.

Chrome Ore Sub-Hearth No Advantage

A plastic chrome ore sub-hearth is probably of no advantage where the sintered-in layer is thin because the hearth surface is not maintained closer than about 5 in. above or below its initial level.

In general, chrome brick beneath the working surface is preferable to magnesite brick because the chrome brick, in spite of its lower resistance to slag attack, is relatively nonhydrating.

In general, present evidence is insufficient for a definite judgment as to which type of bottom is really best, all things considered. After the first year of operation maintenance appears more important than the type of bottom. It is hoped that more direct evidence on some of the points which are still uncertain may be had by drilling some older bottoms in the near future.

From a paper presented before the National Open Hearth conference of the American Institute of Mining and Metallurgical Engineers, Chicago, April 24-26.

ASTM Standards on Electrical Heating Alloys

Current edition of ASTM standards on electrical heating and resistance alloys comprises some thirty specifications and tests developed by Committee B-4. The 184-page publication includes standards for electric furnace alloys, materials for radio tubes and lamps, heat-resisting alloys, thermostatic metals.

In addition, book carries a technical paper entitled "Calculation of Electrical Contacts Under Ideal Conditions," by E. I. Shobert II, research engineer with Stackpole Carbon Co. Paper presents a series of calculations in which some of the variables in contacts are put in their proper relationship.

Copy of standards can be obtained from ASTM headquarters, 1916 Race street, Philadelphia.

VIBRATIONLESS HAMMER

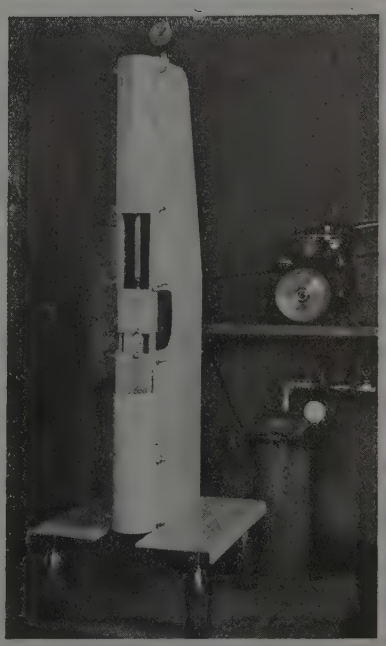
Delivers high impact pressures with smaller power requirements. Dynamically balanced action of descending upper ram and ascending anvil controls vibration

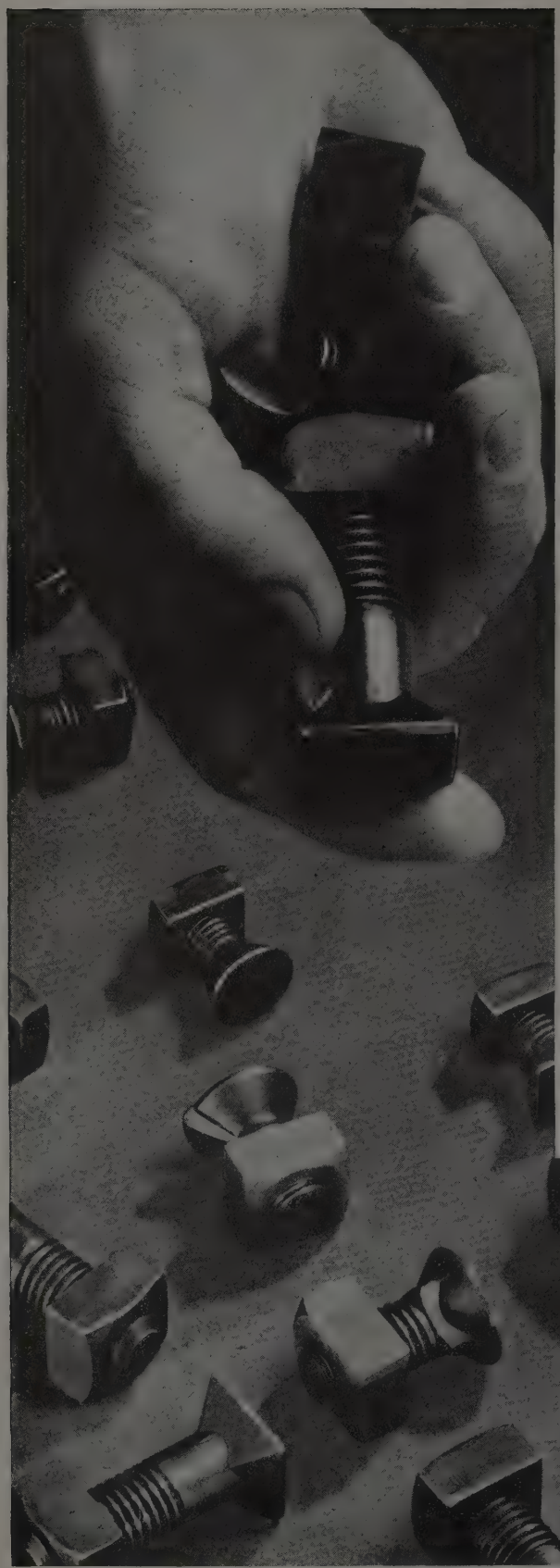
INTENSE impact pressure and vibrationless operation are characteristics of a power hammer which utilizes dynamically balanced action of descending upper ram and ascending anvil. As the ram moves down under gravity and air pressure in the upper cylinder, the heavier anvil moves up to meet it. Precise valve timing and the principle of conservation of momentum are employed to bring both masses to rest at approximately the same point in each stroke of the operation.

Designed and built by Professor Arthur F. MacConochie, Department of Engineering, University of Virginia, the hammer eliminates need for heavy foundations because the deceleration pressure of the upper ram is neutralized by the deceleration pressure of the moving anvil. (Glass supports of the model illustrated have no significance other than to emphasize this characteristic.) None of the energy of impact is transmitted to the earth.

According to Professor MacConochie, a power hammer with a stationary anvil has its pressure of impact partially neutralized by the semi-plastic steel in the immediate neighborhood of the hammer face. As the ram slows down, ram and work move together momentarily against the powerful elastic restraints of the anvil and its supports. In the later stages of the action, energy stored in these anvil restraints is partly expended in striking the work from below (as would appear from the lateral spread and grain refinement on the underside of the work.)

In the case of the vibrationless hammer, states Professor MacConochie, a more equitable distribution of hammer work is realized inasmuch as the anvil is directly driven and therefore is not merely a secondary recipient of ram energy. If, however, the velocities attained respectively by ram and anvil at the instant of impact were inversely proportional to their masses as is the case in the model hammer, the energies are not the same. Therefore it can be anticipated that both the character and degree of penetration of hammer work will differ. Principal consideration in making the anvil relatively heavy is to reduce its stroke and so make the hammer more convenient to operate.





RB&W puts a PLUS in plow bolts

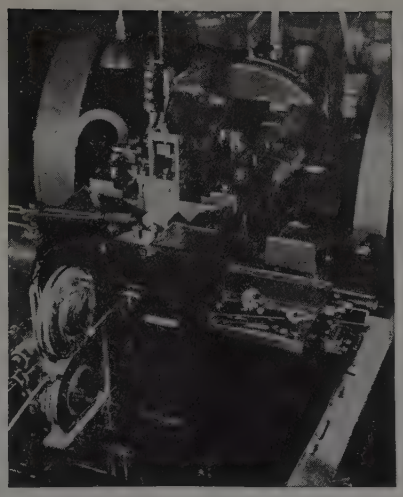
RB&W makes more plow bolts than anybody else in the world. Such volume production on an article of special usage suggests that RB&W must build into its plow bolts refinements that the users consider of major value.

Most of the world's largest manufacturers of farm machinery who for years have standardized on RB&W EMPIRE, recognize the fact that RB&W engineers into its product extra strength and accuracy and fine finish . . . uniformity and dependability.

When you use RB&W EMPIRE Plow Bolts . . . or any other products in the complete quality line of bolts, nuts, screws, rivets and allied fastening products . . . you will appreciate how RB&W's 101 years of experience and technical advancement translate themselves into terms of fastest assembly, maximum holding power and superior appearance.



MILLIONS A DAY — One of RB&W's three high-capacity plants is located at Rock Falls, Illinois, close to many of the great manufacturers of farm equipment. In recent years, this plant has been greatly expanded, now delivers all types of bolts, screws, rivets and allied fastening products to the other industries that have grown up in the middle west.



COLD-HEADING—RB&W Empire Plow Bolts are headed by cold-forming — a method in which RB&W specializes. Much of RB&W's development work has been in the direction of cold-heading which, experience has proved, results in a product of increased strength, greater accuracy, almost perfect uniformity, improved appearance.



ACCURATE THREADING — After the length of the body to be threaded has been reduced to proper diameter (an operation which also increases tensile strength), the threads are cold-formed on this machine. This thread-forming method eliminates tear in the metal and provides an accurate-lead, close-tolerance thread and stronger metal structure.

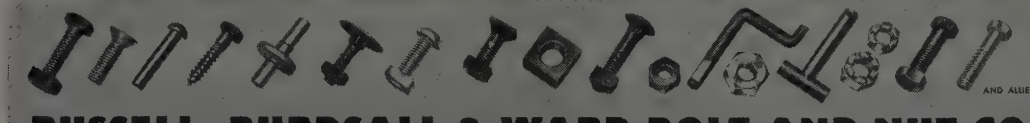


CLOSE FIT — Accurate shape and diameter of the head — in order to insure a perfect fit in the cast or countersunk hole — are provided by the extra operation of trimming, which removes excess "flash" and leaves a smooth, accurate head surface. This extra step saves the customer extra grinding and the danger of the bolt heads being loose.



101 YEARS *Making strong the things that make America strong*

Plants at: **Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill.** ***Sales Offices at:*** **Philadelphia, Detroit, Chicago, Chattanooga, Los Angeles, Portland, Seattle.** ***Distributors*** **from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. Also, the industry's most complete, easiest-to-use catalog.**

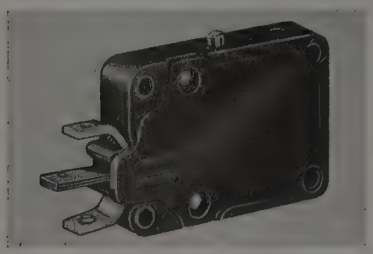


RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Industrial Equipment

Miniature Switch

Model M rolling spring snap-action electric switch, a product of Acro Electric Co., 1323 Superior avenue, Cleveland 14, is now in production with a molded case that includes a fully recessed



cover which is inserted clear of four mounting holes. To make wiring easier, heavy solder terminals are used.

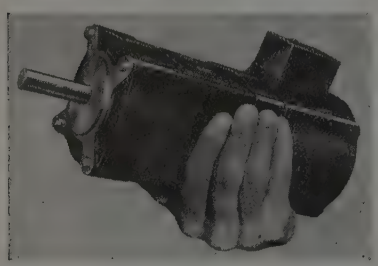
Switch is made for single and multiple assemblies and is so small that four of them can be mounted in a space of less than 1⅛ in. It is made with single pole, single or double throw contacts and is rated at 10 amp 125 v, ac.

Steel 7/22/46; *Item No.* 9553

Explosion-Proof Motor

A compact, light 2-hp explosion-proof motor for continuous duty is announced by Electrical Engineering & Mfg. Corp., 4606 West Jefferson boulevard, Los Angeles. An aircraft type motor with armature speed of 9000 rpm, it is safe for use in hazardous locations.

Motor is particularly suited for such



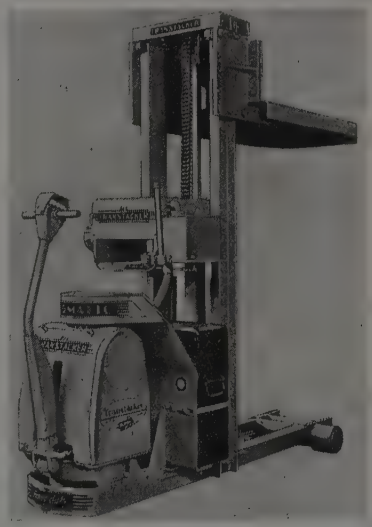
applications as fan and blower, pump, winch and other drives. It is completely insulated with glass insulation and high-temperature varnishes and is offered for operation on direct current of 28, 32 or 110 v.

Steel 7/ 22/46; *Item No.* 9361

Fork Lift Hand Truck

New battery-powered high-lift tiering unit, the Transtacker, has been designed by Automatic Transportation Co., 149 West 87th street, Chicago 20, in four models for handling all types of pallets and skid platforms. Load capacities range from 2500 to 4000 lb, and platform and forks raise to heights of 68 and 64 in. respectively. Each unit is a natural where floor space is limited or where extreme maneuverability is essential.

Completely electric powered, with motorized hydraulic lift, the unit combines low initial investment (about $1800 for illustrated unit) and light weight (about 1900 lb) with operating economy and freedom from fire hazard. Operation is by "finger-tip control." Two buttons on guide handle controls forward and reverse power, and a third button operates the lift. Horizontal speed and "dead man



control" brake are controlled by vertical position of guide handle.

Four Transtacker models are: Platform model for skid loads, capacity 4000 lb (illustrated); open-face pallet model, capacity 3000 lb.; straddle type pallet model for single and double-face pallets, capacity 4000 lb.; and extended load or "cantilever" pallet model for double or single-face pallets, capacity 2500 lb.

Steel 7/22/46; *Item No.* 9631

Tank Preheater

A new bulk tank preheater which provides about 38 sq ft of direct radiation plus 10 sq ft of secondary shell heating was recently developed by Rempe Co., North Sacramento boulevard, Chicago. Called the Hot Spot, it is made to fit any size tank having a manhole 16½ in. or larger.

To assure preheating, unit is provided with a flow accumulator which makes it necessary for liquids to flow over the coils before entering the suction line. Either steam or hot water can be used in operating the preheater. Standard 1½-in. steel pipe is used as coil in the unit, and the shell is 12-gage steel having a 16-in. OD.

Steel 7/22/46; *Item No.* 9171

Appliance Mover

Constructed entirely of magnesium this home delivery appliance mover produced by Keen Mfg. Corp., Flat Rock,

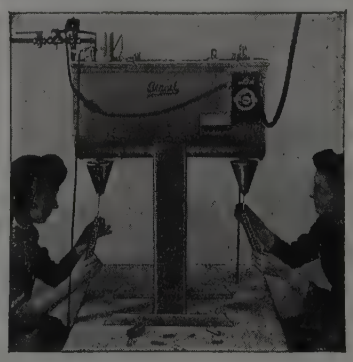


Mich., weighs 27 lb and is adjustable in length from 41 to 58 in., and in width from 19 to 29 in. Designed to handle stoves, refrigerators, or other similar products, mover has stairway hand holds which fold under and snap out of the way.

Steel 7/22/46; *Item No.* 9635

Battery Compound Tank

A new gas-fired, electrically controlled production tank for heating, melting and pouring battery transformer, capacitor and resistor compounds is announced by Aeroil Products Co., West New York, N. J. Known as model 22TGT, it is heated from inside through a patented removable immersion tube system which,

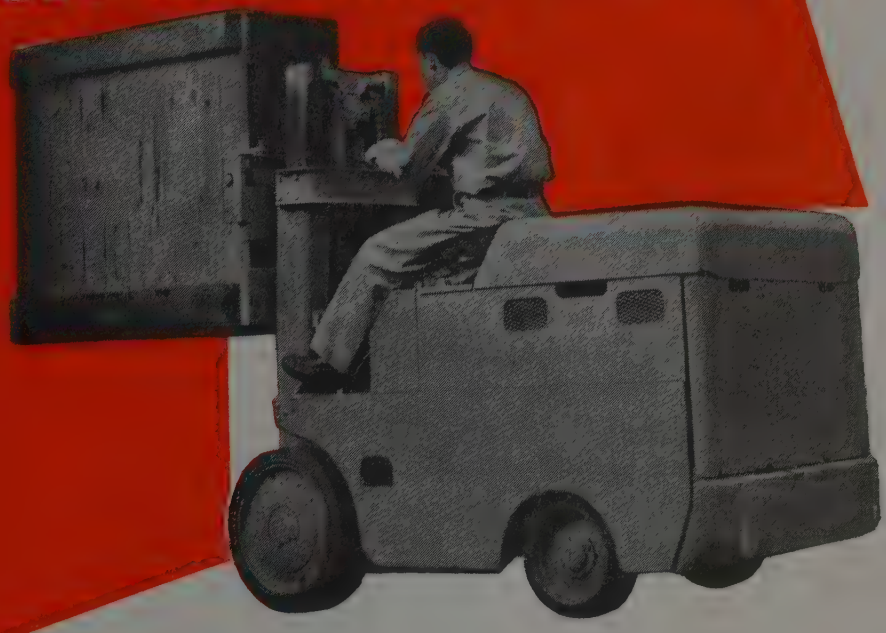


plus full insulation, brings about a saving of 50 per cent in time, labor and fuel.

The 10 gal unit is equiped with two separately heated valves at opposite ends of tank so that two operators can work independently. Electrically operated thermostatic controls regulate tempera-

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 124.)

EXIDE-IRONCLAD POWER PROVIDES THE THREE "HIGHS" THAT ASSURE FULL SHIFT AVAILABILITY



Exide-Ironclads have the *high power ability* needed to meet the higher kilowatt demands encountered in frequent "stop and go" service . . . they provide *high maintained voltage* throughout discharge, assuring a uniform rate of operations . . . and their *high capacity* keeps electric industrial trucks steadily on the job throughout each shift.

These—with Exide dependability, long-life, ease of maintenance and safety—assure "full shift availability," plus the increased tonnage and greater economy that result.

Write us for a FREE copy of the bulletin "Unit Loads" prepared by The Electric Industrial Truck Association. It tells how to cut handling costs up to 50% . . . covers latest developments in materials handling . . . and includes actual case histories.

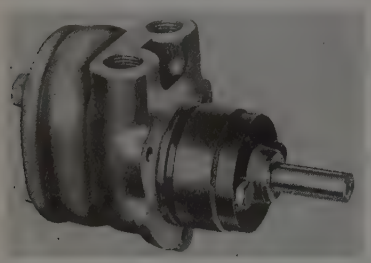


THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*

ture from 100 to 550° F. A safety pilot control shuts off gas line should pilot light be extinguished.
Steel 7/22/46; *Item No.* 9375

Rotary Pump

Series K. rotary pumps manufactured by Geo. D. Roper Corp., Rockford, Ill., operate on pressures up to 150 psi at 1740 rpm and may be belt, chain or direct driven. Small and compact, these pumps have interchangeable mounting



brackets for either hub, flange or foot mountings.

Pumps are supplied with mechanical seal or packed box, with or without relief valve, with nominal capacities of ¾, 1½ and 3 gpm. This self-priming, high suction lift pump has bronze bearings throughout.
Steel 7/22/46; *Item No.* 9561

Four-Stage Machine

Four-stage machine for drilling, spotfacing, counterboring and tapping holes has been developed by Hydraulic Machinery Inc., 12825 Ford road, Dearborn, Mich. Its cycle of operation is entirely automatic except for loading and unloading.

To start cycle part is manually loaded and clamped into position. Upon closing safety door, electric contact is made and machine automatically indexes to position, all heads moving forward and completing the cycle of drilling, spotfacing, counterboring and tapping. Machine enables one part to be loaded while another is going through machining cycle.

Equipment is operated hydraulically and controlled electrically. Provisions are made to prevent indexing until part is properly clamped in position. All hydraulic power and control valves are mounted in base with access doors for servicing.
Stee 7/22/46; *Item No.* 9552

Vapor Degreaser

Small basketed parts are cleaned in a 2-dip immersion vapor degreaser developed by Detrex Corp., Detroit. Designated as Model 500-C-1, the conveyorized



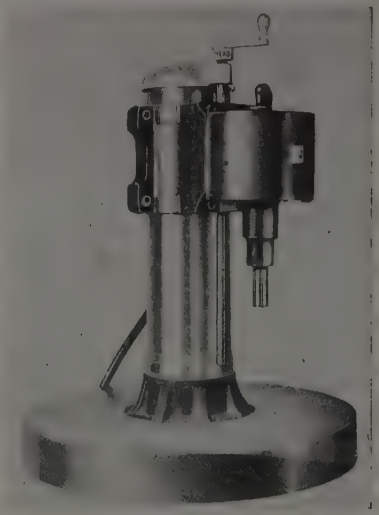
machine permits a choice of any one of several cleaning cycles, the type and degree of soil contamination being deciding factor in selection of method of cleaning.

In immersion-vapor cycle, work being cleaned is dipped in hot solvent in first chamber and passed through solvent vapors in final phase. The boil-rinse-vapor cycle consists of cleaning work in solvent at a boil temperature, at a rinse temperature and in vapor. A third method, the vapor-immersion-vapor cycle, allows work to be passed through first chamber where solvent level is low allowing accumulation of oils and grease, into hot solvent in second chamber and then through solvent vapors in final phase.

Degreaser is fabricated of 10-gage steel and structural steel, all welded, with a water jacket condenser completely encircling machine. Solvent collecting trough below condenser carries reclaimed solvent through water separator to storage tank or second chamber.
Steel 7/22/46; *Item No.* 9422

Pneumatic Column Press

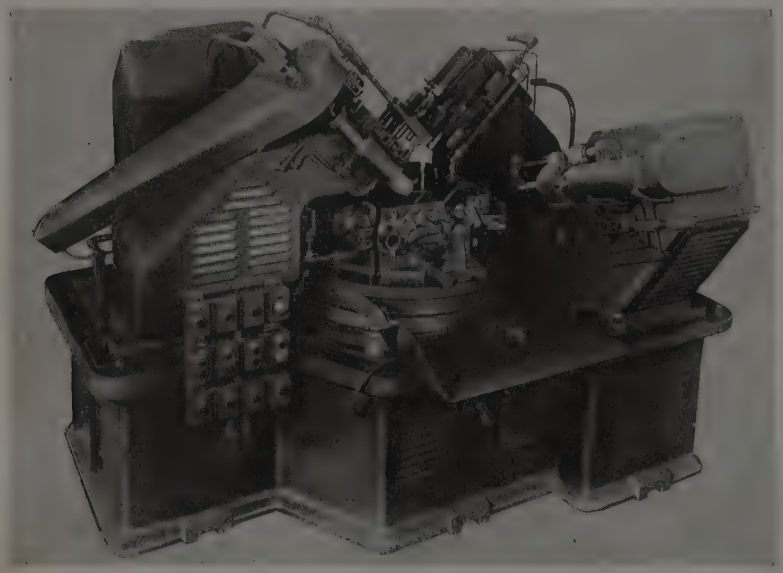
Mead Specialties Co., 4120 North Knox avenue, Chicago, has developed an air-operated column press which delivers a ram pressure of 3000 lb on 110-lb line pressure for small to medium runs where it is desirable to leave fix-



tures permanently mounted to base. Successive operations may be performed by simply swinging ram over desired fixture, raising or lowering it to correct height by means of raising screw, and locking it in place with two drawbolts.

For jobs involving cold-forming of metal, the slow squeeze of press is satisfactory because of reduced tendency to fracture the metal. The same is true with respect to hot-forming plasties, and to assembly jobs involving press fits.

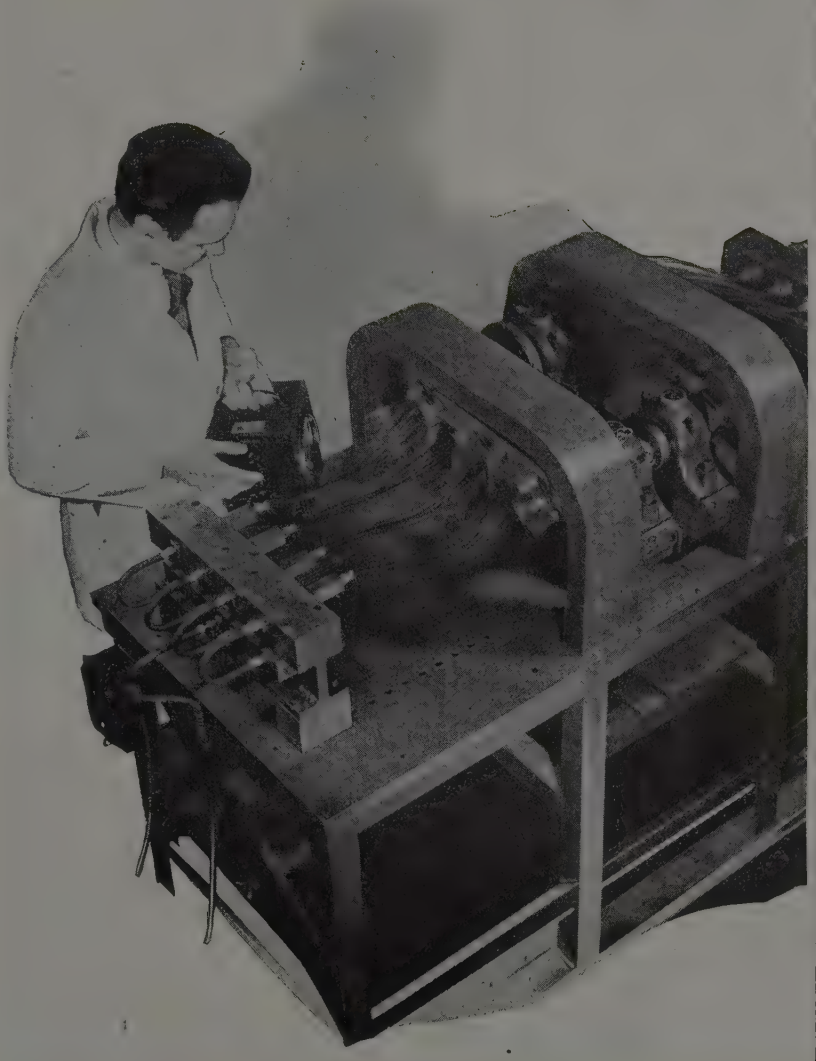
Overall height of press is 24¾ in.



(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 124.)

Hose does the Hula ...

AT 1800 WIGGLES A MINUTE



THE strobotach this man is using will make sure the hydraulic hose lines are vibrating 1800 times a minute.

This wiggling device was designed by Weatherhead engineers to meet SAE specifications requiring the regular testing of sample hose assemblies taken from standard production runs.

The hose is given this grueling treatment for 200 hours to prove the dependability of the complete assembly and serves to demonstrate how it will stand up after years of service on automobile, truck, or bus.

To make the test even tougher, hot oil, held at 250°F. and under 45 pounds per square inch pressure is circulated through the hose lines as they are whipped round and round.

So when you use any Weatherhead products, you're sure of this: It's your best buy because the research and testing behind it have made it the most highly developed, but competitive priced, product of its kind.

LOOK AHEAD WITH

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THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO

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ATTENTION DESIGN ENGINEERS

You can benefit most by calling Weatherhead while your product is in early design stages. A thorough study of your products can often result in improved performance, simplified serviceability, and savings in assembly, time, and labor.

and diameter of table is 23½ in. Stroke is 3 in. while power factor is 28 times line pressure. Maximum clearance of ram above table is 11 in. Maximum depth of throat 4¾ in.
Steel 7/22/46; *Item No.* 9415

Metal Sorter

Portable Metalsorter, type B, manufactured by Control Equipment Co., 547 Brushton avenue, Pittsburgh, identifies and sorts pure metals, steels and nonferrous alloys, requiring no special electrical power supply.

It employs the tribo-electric effect, by which a metallic specimen of standard character is rubbed against surface of an unknown or doubtful piece. If a chemical or metallurgical dissimilarity



of two pieces exists, a minute electrical current is generated and registered by an indicator on a calibrated scale.

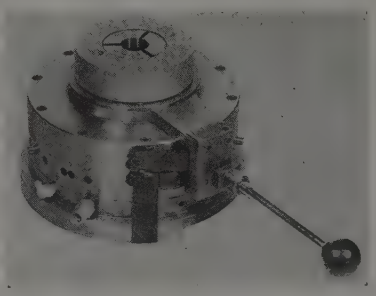
Control unit of sorter contains a thyratron operated timing circuit, and electronic bias supply and a measuring circuit. A reciprocating tool is connected to control unit by a multiple conductor cable and plug. Tool is provided with a specimen holding check and flexible lead for connection to metal to be tested.

Test is nondestructive and may be applied to identification of built-up machinery. Pieces being tested which are in metallic and electrical contact with adjoining members does not effect accuracy of test.
Steel 7/22/46; *Item No.* 9413

Collet Indexing Chuck

Redmer Air Devices Corp., 601 West Washington boulevard, Chicago, announces a new air-operated collet indexing chuck that can be used as a regular holding fixture without indexing for other operations such as drilling, milling and tapping.

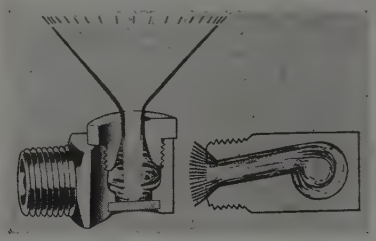
While indexing, it is not necessary to remove fixture from bed of machine in changing over to another position, as indexing posts and numbers are located on



outside of fixture. While indexing is manual, collet is air operated.
Steel 7/22/46; *Item No.* 9366

Nozzle Insert

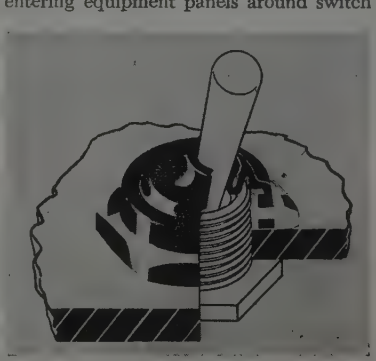
Use of a tungsten carbide insert increases service life of vortex type spray nozzles up to 100 times, according to Spraying Systems Co., Chicago, makers of the Whirljet nozzle. Abrasive whirling action set up by vortex, which resists action of abrasive particles that may be



mixed in liquid to be sprayed, is offset by the insert, which effectively reduces wear.
Steel 7/22/46; *Item No.* 9634

Sealing Nut

New mounting and sealing nut designed to prevent dirt, water or gas from entering equipment panels around switch

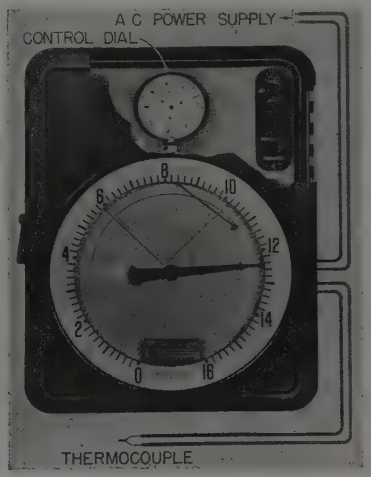


and control shafts is manufactured by Radio Frequency Laboratories Inc., Boonton, N. J. Shown here in toggle switch application, base of nut is sealed to panel by internal rubber ring which permits metal-to-metal contact between nut and panel. Elastic sleeve tightly grips protruding switch handle. Outstanding use of device is said to be with pressurized and moisture-proof equipment, whether operating submerged or at high altitudes.
Steel 7/22/46; *Item No.* 9636

Potentiometer-Pyrometer

An electronic potentiometer-pyrometer announced by Bailey Meter Co., 1050 Ivanhoe road, Cleveland 10, records one or two temperatures on a 12 in. diameter graduated chart and indicates on a 29 in. bold scale which encircles recording chart.

Using a 115 v, or 60 or 50 cycle, alternating current power supply, it operates from a thermocouple or from any source of direct current potential which varies



through at least 10 millivolts for full scale range. Conventional thermocouples are used for temperatures up to 3000° F, for temperatures above this figure and for moving objects above 1500° F, radiation type thermocouples are used.

Conversion of direct current potential to alternating is accomplished by special saturable core reactors which are similar in construction to transformers.

Recorder-controllers are offered for air-operated control systems, on-off electric control systems and throttling type electronic control systems. The instrument illustrated is cut away to show its control dial by which the set point may be manually adjusted to any desired temperature.
Steel 7/22/46; *Item No.* 9485

Tube Fittings

Flodar Corp., 331 Frankfort avenue, Cleveland, is announcing new Griptube fittings capable of sealing high fluid pressures and absorbing tube vibrations in tube installations of all kinds. Fittings

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 124.)

For Faster, Positive Driving . . .
and Removal of Nuts, Bolts and Cap Screws

A NEW LIGHTWEIGHT PNEUMATIC REVERSIBLE IMPACT WRENCH

BY Thor



Smallest, Most Powerful Tool of Its Class . . .

A radically new direct-impact mechanism—*exclusive in the new Thor Impact Wrench*—delivers a heavier torque blow *without torque reaction to fatigue the operator.* This is accomplished by applying the power of the motor POSITIVELY to the impact spindle through an anvil. A short, rigid shank on the impact spindle delivers full and efficient transmission of the blow—close to the work and at a larger radius to the spindle center for more power and smoother operation. This new impact wrench is easier to handle because it's lighter and more compact—only 3¾ pounds.

Nuts up to ⅜" thread size can be driven *tighter* . . . or tight nuts removed *faster.* Simplified mechanism eliminates many moving parts . . . assures long tool life and lower maintenance. *Prove its advantages—ask your nearest Thor branch or representative for an early demonstration.*

OPTIONAL LEVER THROTTLE
(Size No. 6-L illustrated at left)

NEW SIZES COMING!
More Thor Impact Wrenches will soon be available—in ¼", ⅝", ¾" and 1¼" capacities.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
Birmingham Boston Buffalo Cleveland Detroit Los Angeles Milwaukee New York Philadelphia Pittsburgh St. Louis Salt Lake City San Francisco Toronto, Canada London, England

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

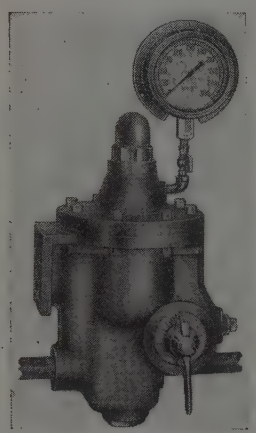
do not twist tube and possess a high tensile strength.

Consisting of three parts, connector body, tightening nut and contractible sleeve, tube is gripped tight, but fitting may be reused repeatedly. Fittings are offered in fourteen styles, each in several tube sizes.

Steel 7/22/46; *Item No.* 9357

Control Valve

Differential oil flow control valve, designed by Bloom Engineering Co., Pittsburgh 12, is instantaneous in action and holds liquid flow constant. Valve thus eliminates flow changes due to pressure variations caused by reciprocating pumps



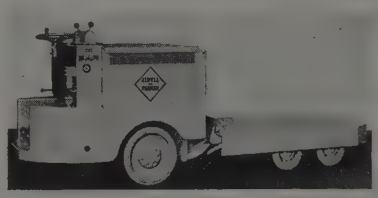
on fuel system, reversal of adjacent furnaces on same fuel line, steam pressure changes to the oil burners and varying resistance of oil burners.

Position of valve handle is a direct measurement of oil flow. Metered flow can be provided for remote indication or for application to combustion control apparatus. Valve sizes are manufactured for flows from 25 gph to 1000 gph. Each valve holds constant flow within 1 per cent of its flow range.

Steel 7/22/46; *Item No.* 9350

Industrial Truck

Illustration shows a new 10-ton capacity industrial truck built by Elwell-Parker Electric Co., Cleveland. New trucks of this type are driven by storage



batteries and electric motors. Features, aside from compactness and power, are simplicity, instant responsiveness, ease in maneuvering, smooth, quiet operation.

Body of truck is low and operator has complete visibility of platform, load and surroundings. Overall length is 147 in., width 45 in. It is steered by means of all six of its wheels, four of which, under platform, assure stability of load. It can turn in a 71 in. aisle. Speed may be accelerated to 6 mph.

Steel 7/22/46; *Item No.* 9412

Flexible Toolholder

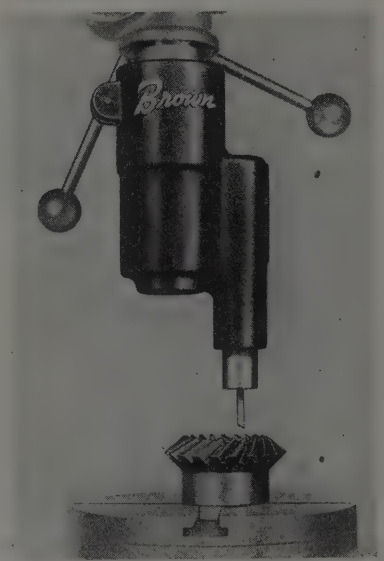
Burg Tool Mfg. Co., 6709 South San Pedro street, Los Angeles, announces a complete line of Tool-Flex tool holders which, due to the flexibility and resilience of a neoprene mounting, cut down tool breakage. All metal parts are of heat treated alloy steel.

Available in four combinations of straight and tapered shanks and collets, these holders eliminate bell-mouthing and are self-centering. Tools can be used on automatic screw machines, engine lathes, tapping machines, radial drill presses, etc. A wide variety of sizes is available in each of the four sizes.

Steel 7/22/46; *Item No.* 9616

Drill Press Converter

Any size or make drill press is said to be instantly converted to perform filing, cutting, sawing, or slotting operations through the use of this unit, manufactured by Leo G. Brown Engineering Co., Los Angeles. Solid steel cam mounted be-



tween two pre-loaded ball bearings converts drill press rotary action to a vertical reciprocating action and simultaneously increases power output.

Steel 7/22/46; *Item No.* 9632

FOR MORE INFORMATION on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9353	9382	9485
9361	9422	9357
9631	9415	9350
9171	9413	9412
9635	9366	9616
9375	9634	9632
9561	9636	

7-22-46

NAME ..... TITLE .....

COMPANY .....

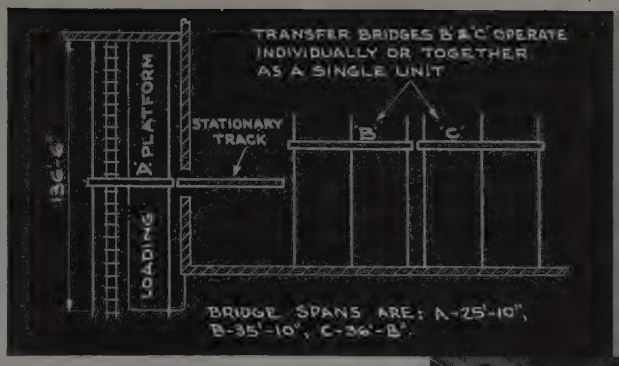
PRODUCTS MADE .....

STREET .....

CITY and ZONE ..... STATE .....

Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)

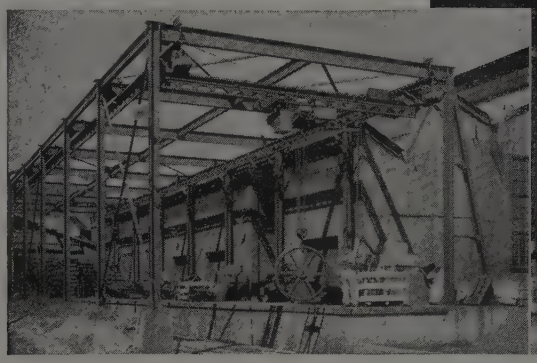


5 TON TRANSFER BRIDGE SYSTEM with Advanced Features

(At right) The two inside bridges are shown interlocked and being operated as a single unit. Either bridge may be operated individually. All control is centralized in the push button station suspended from the carrier.

(Below) The outside bridge serving the loading dock interlocks with inside track at doorway.

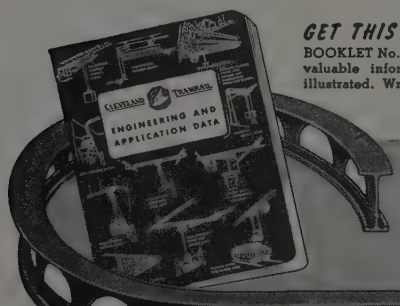




CASTINGS can be picked up at any point in the large shipping room, and loaded onto railroad cars or trucks at the outside of the building with this efficient 5-ton transfer bridge system. The bridges and stationary track interlock, enabling the motor-driven carrier to operate on any bridge.

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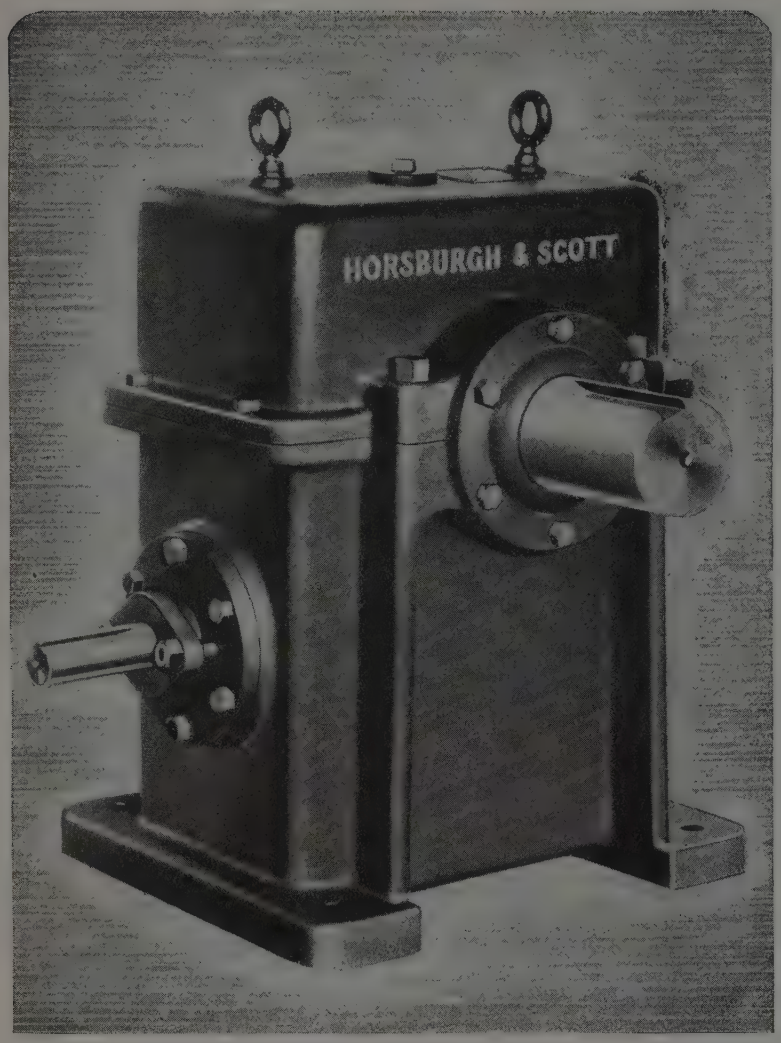
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Cutter Life

(*Concluded from Page 83*)

Fig. 6. This gives a negative engagement angle in both the radial and the axial direction, and the longest cutter life when face milling steel.

Operating Detail and Observations: The 8-in. face mill was operated at 238 rpm (498 sfpm). A 2½-ipm table travel was used, giving 0.0105-in. feed per tooth. A depth of cut of 0.150-in. was taken on all runs to facilitate a comparison with previous test runs.

A tool bit was considered dull as soon as the cutting edge showed the first sign of breakout. This was detected either from the marking on the inner side of the chip which came from the cut, from the lines left on the work surface by the corner angle, or from the change in the sound made by the milling operation.

A record was made of all operating detail including the distance traveled to tool breakdown. Enlarged to scale, sketches were made of the wear developed in the vicinity of the cutting edges along the corner angle, the chamfer and the face of the cutter to aid in determining why the tool bit failed. This procedure has been discussed previously.

Results of Tests: At the conclusion of the series of runs, the results of the tests were graphically portrayed, as shown in Fig. 7, by plotting the number of linear inches milled by each tool up until the time that the cutting edge first showed signs of failure.

Under the specific conditions of the test, the following conclusions have been reached:

1. Based on averages, the brazed tip runs about 20 per cent longer than the mechanically-held tip before it reaches the failure point.
2. The brazed tip design gives consistently longer runs than the mechanically-held tip design even though in some cases the maximum length of runs for both designs was identical.
3. The brazed tip design gives more consistently uniform results since there is a minimum difference between the longest and the shortest runs when compared with the mechanically-held tip design.

The general trend of these results is extremely interesting because most of the thought in the past seems to have been centered about mechanically-clamped carbide blanks in contrast to carbide blanks brazed to solid bodies. These results also offer a challenge for the continuation of this work to determine why the carbide blanks brazed to steel shanks or blades should indicate an improvement in face mill performance when compared with mechanically-held carbide blanks.

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ENGINEERING OFFICES IN PRINCIPAL CITIES

Tools Steels

(*Concluded from Page 84*)

time, labor, material, and machining costs. These savings, according to Jessop Steel Co., Washington, Pa., producer of cast-to-shape steel parts, are as follows: Machining costs have been reduced approximately 65 per cent; purchase weight of material has been lowered by 50 per cent; total time saved in placing dies in operation averages 5 to 6 weeks.

Patterns used for the castings possess suitable draft and are well finished to insure proper molding and thus eliminate need for finish machining of the mold surfaces. Allowances incorporated in the design of the patterns are of the following order: Shrinkage tolerance is ¼-in. per sq ft, machining tolerance of the surface to be cut is ⅛-in. The latter allows for both a roughing and a finishing cut.

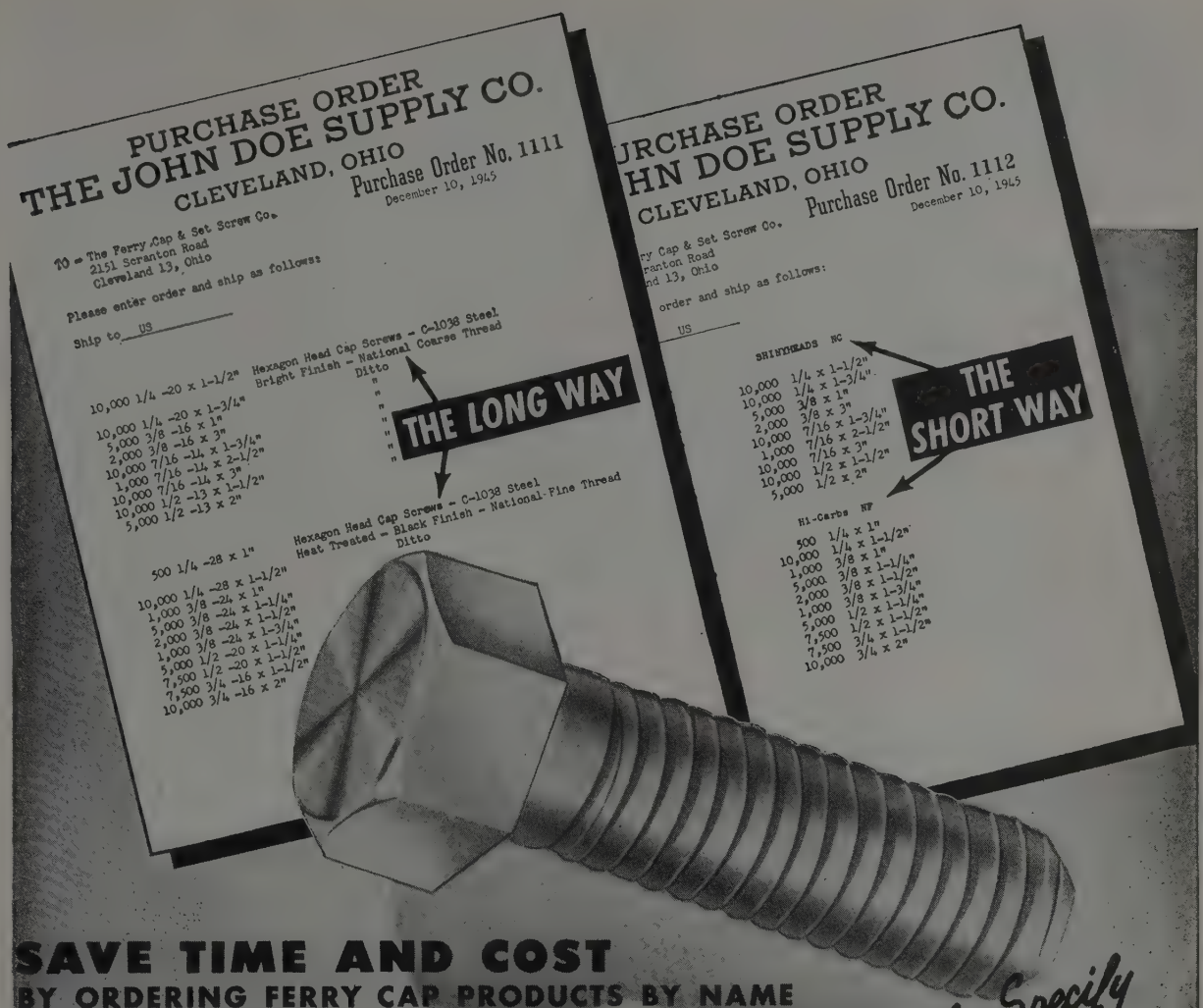
Steels used for castings are melted in either induction or electric arc furnaces to insure uniformity of composition and minimum contamination. The melt is then poured into molds designed to permit the casting to cool slowly and evenly. This uniform cooling prevents the formation of the coarse dendritic structure which is conducive to excessive shrinkage. When large dies are poured, the heaviest sections are cored out, and an addition of reinforcing ribs is used This allows a greater strength to be obtained, at the same time reducing the weight and material otherwise required. The castings are annealed to refine the grain size and to develop a spheroidal structure for good machinability.

Steels regularly cast are of the air hardening, oil hardening, water hardening, hot work flame hardening, stainless, and heat resistant types. Specialty steels and even steels made to customer specification are also cast. With some of these analyses, hardnesses of rockell C 65 can be achieved with minimum distortion in the cast articles. Accompanying illustrations and their captions give some idea of the range of tools and dies that can be made by the process.

Stainless Steel Trade Names Listed in Booklet

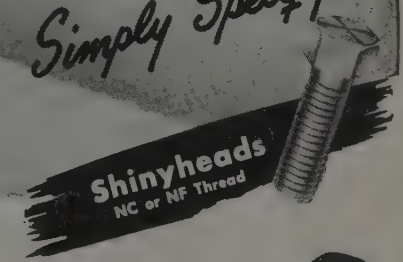
Present and former trade names of stainless steels of all leading producers are listed in a booklet published by Rustless Iron & Steel Division, American Rolling Mill Co., Baltimore.

Steels are broken down into straight chromium grades and chromium-nickel grades, and listed according to hardenability, austenitic and martensitic qualities and machinability. Chart shows American Iron & Steel Institute types analyses, by American Metals Society and American Society for Testing Materials designations and by government specifications.



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Hi-Carbs mean hexagon head screws of high carbon C-1038 steel, double heat treated, black satin finish, NC or NF thread.

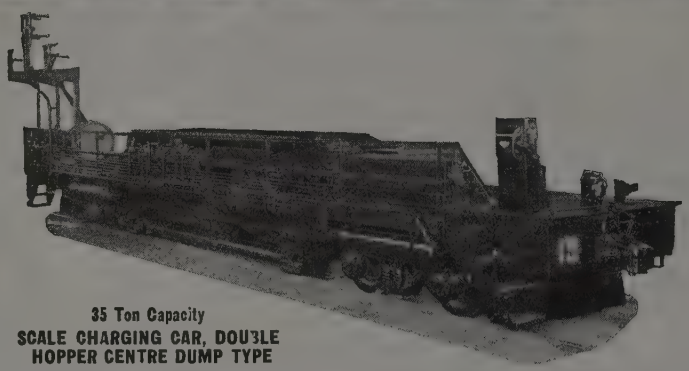
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Drawing Aluminum

(*Concluded from Page 94*)

10. The design is prominent on both sides of the metal and the back side is in reverse. Special knuckle joint presses that provide a steady squeeze are used for both embossing and coining. The soft or intermediate tempers of aluminum give best results because the metal must flow readily to every nook and corner of the design.

The punch and die are the usual tools used for embossing and coining. They should be made of the best tool steel and kept perfectly smooth and highly polished. The embossing die may be one of three kinds: (1) It may be open at the point where the design or raised portion of punch comes down; (2) it may be a closed die in which the design in the die is an exact negative of the punch's positive; or (3) it may be a steel contact roll faced with smooth rubber, in which the punch is in the shape of a roll with the design raised on its periphery. The latter type is particularly adapted to the embossing of aluminum foil and other thin strips.

Coining closely resembles embossing except the design is in relief, with sharp rather than rounded edges. The design may cut through or appear in reverse on the under side if the metal is thin, or the back side may be plain or have a totally different design raised there. The pattern may be cut into either the anvil or the die.

Fig. 10 shows an 800-ton knuckle press semi-coining an aluminum alloy tray. A combination of embossing and coining, it is a mechanical means of doing the work of the hand chaser by causing metal to flow from one part of the emboss to another.

Some clearance should be allowed for any flash that may occur around the circumference of the blank; when the die is completely closed there is danger encountered of damaging the press with over-gage blanks or the accidental feeding of two blanks at once. Such dies are usually mounted on hydro-pneumatic pressure equalizing cushions as a precautionary measure. A lubricant should not be used for embossing and coining since it is necessary that the tools and the blanks be kept free of foreign substances. In certain classes of coining, however, alcohol or another light lubricant may be beneficial.

—o—

Since the release of critical materials for general industrial use, centrifugally cast aluminum bronze bushing stock is again available to machine shops and manufacturers with limited bronze requirements, through national distributors of Torrance Brass Foundry, Torrance, Cal., the company announced recently.

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No. 10-W Youngstown size; 40 H.P.; 230 volts; d.c. maximum rating.

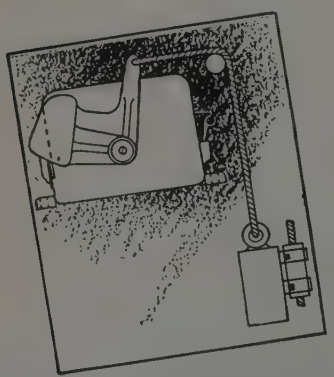
Now, a *weight-operated* Safety Limit Stop for the smaller horsepower crane-hoists. Tripped by *weighted* operating-lever when the danger zone is reached . . . reset *automatically* by suspended *weight* when controller is reversed to lower the hook-block. Other advantages are:

1 No lubrication required—Oilite bearings are self-lubricating and long-lived. This means that the costly and sometimes forgotten item of lubrication-maintenance is eliminated forever.

2 Compact—easy to mount—Small, over-all dimensions—four convenient mounting holes—one suspended weight.

3 Small reset travel—High crane lifts are possible with this new No. 10-W because the amount of travel between "run" and "tripped" positions has been kept at a minimum.

4 High interrupting capacity—Two normally open and two normally closed contacts, mechanically interlocked and with wide, vertical opening, always assure positive interruption of the hoist motor current.



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Analyzing Stresses

(*Concluded from Page* 99)

measure instantly to one millionth of an inch, the average strain in a ½-in. length. Each gage consists of a tiny loop of copper-nickel wire with a diameter of 0.001-in.—finer than human hair. This is cemented to the steel surface so that it will change in length exactly as does the steel on which it is mounted.

Stretching causes the diameter to decrease, changing the resistance. While the change in resistance is extremely small, it is multiplied by electronic equipment to a point which can be measured by conventional recording devices.

Test loads were applied by placing 60-ft lengths of structural steel on the trusses in a manner which concentrated the full load on purlins located directly above the vertical truss members. Strain measurements were recorded by three automatic switching units and three SR-4 strain recorders made by Foxboro Co., and rented from Baldwin Southwark.

Record of Strains Made

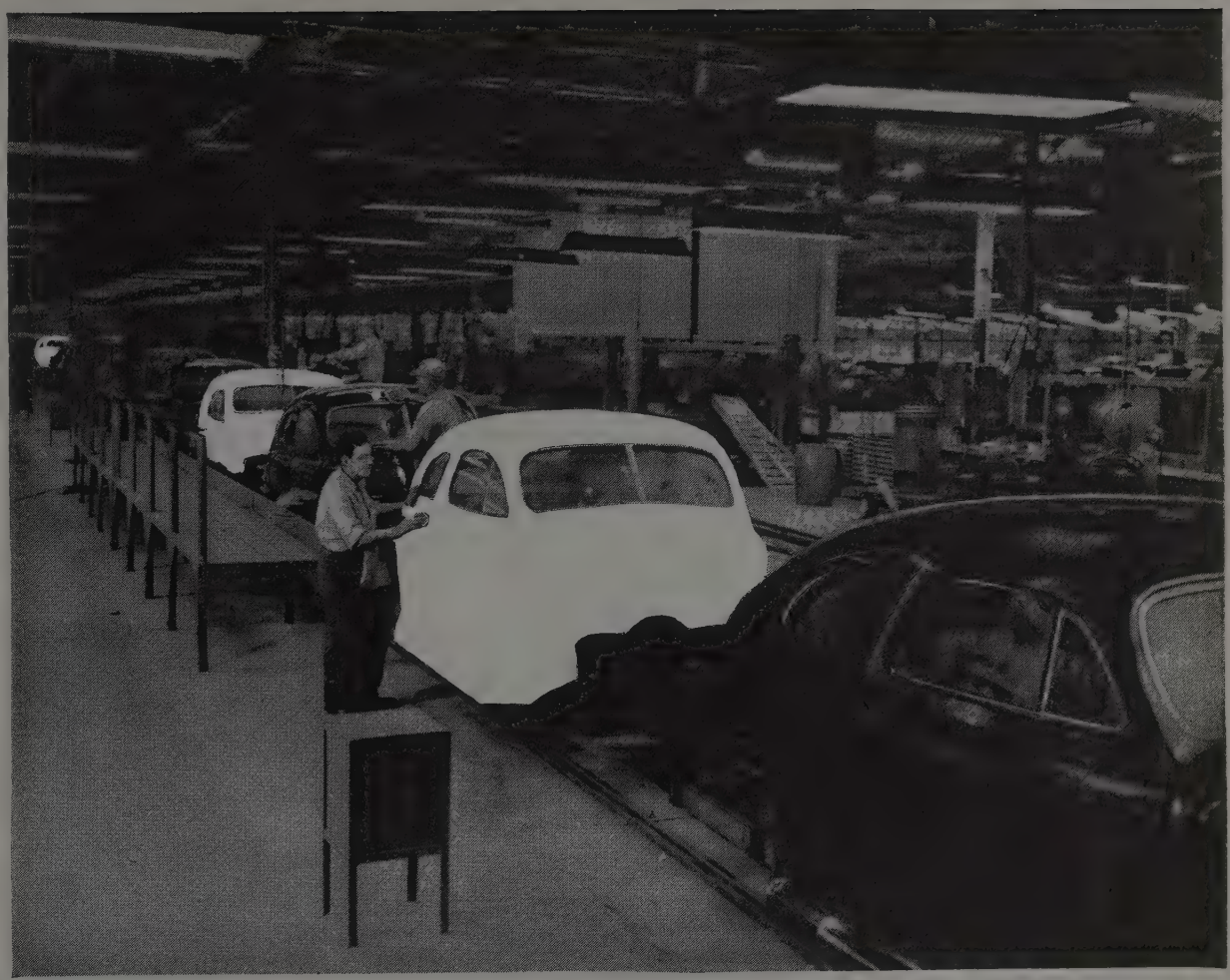
Each pair of instruments, including a switching unit plus a recorder, made an automatic written record of the strains at 48 gage points so that 144 individual strain readings were recorded in about two minutes. More than three miles of wire were required to connect the gages to these instruments.

The first test was made under a load somewhat over the design load, after which the entire load was removed. In the second test the following day, trusses were loaded to a total of 254,000 lb—the equivalent of dead load represented by a cement tile roof deck plus the live load figured at 35 lb per square foot. Maximum deflection with this peak load in place was about 2 in.

After the peak load was reduced to 196,000 lb, it was left on the trusses for three days over a week end. Both trusses, after removal of the total live load showed a maximum residual deflection of 1/16-in. Approximately 3000 strain readings were recorded at intervals during the loading and unloading tests, as well as under the peak loads.

Carbide Gripping Inserts Produced in Various Sizes

Kengrips, gripping inserts used in various holding, clamping and feeding devices, are being manufactured by Kennametal Inc., Latrobe, Pa. Made of tungsten carbide Kennametal, grips are produced in forms of disks and squares with diamond serrated surfaces. The four sizes manufactured in either form are: ½ x ⅛-in. thick; ⅝ x ⅛-in. thick; ¾ x 3/32-in. thick; and 1 x 3/32-in. thick.



Wire ahead!

to keep in step

HERE is a picture of what *can't* happen if the split-second coordination, for which automobile plants are famous, is to prevail.

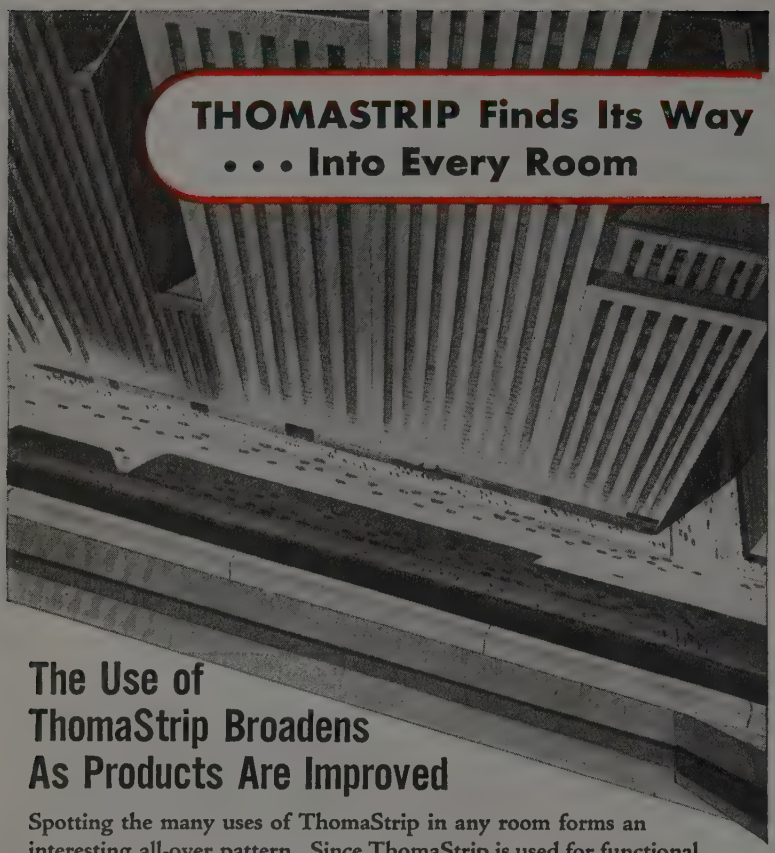
But it can happen, and it *will* happen in any plant without adequate wiring. For, when obsolete wiring, overtaxed wiring, over-extended wiring can reduce the efficiency of man and machine by 25 to 50 per cent, production is reduced accordingly. With lost production, you can't keep in step with competition.

It may pay you to check on your wiring at once. Ask your plant power engineer, consulting engineer, electrical contractor or power salesman. A wiring survey now may save costly shut-downs and expensive alterations later.

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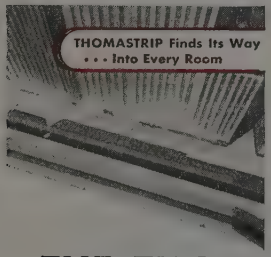
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Thomas Strip
COLD ROLLED STRIP STEEL

Testing Bolts

(*Concluded from Page 87*)

end of the elastic range, and tensile strength being maximum load applied.

From the diagrams it may be seen a cold worked 0.35 per cent carbon steel bolt is relatively brittle (A) compared to a heat-treated bolt of about the same strength (C). It also may be seen (C and E) that bolts may be heat treated to produce varying degress of strength and ductility, the latter becoming greater as strength decreases.

It is recommended that the full-size bolt in its finished form be tested, rather than a standard ½-in. tensile test specimen. The standard specimen has too many drawbacks and limitations when applied to bolts.

First, it requires a bolt at least ¾-in. diameter and 4 in. long from which to machine the standard specimen. Since the test bar represents only the center portion of the bolt, it may not reveal the true condition of a bolt which may be softer in the core than on the surface. The notch effect of the threads causes a type of stress distribution and a restriction of plastic flow that are not present in the smooth body of the test bar. It is becoming more widely recognized that, where possible, threaded parts should be tested full size rather than with a tensile strength speciman.

Defining Tensile Strength

Tensile strength is the maximum load carried by the bolt. It may be expressed in pounds or in pounds per square inch. If expressed in pounds per square inch, maximum load should be divided by the mean area, not the root area. Mean area is base on the mean of the pitch and minor diameters of the thread. This arbitrary figure of mean area was chosen by comparing tests of many bolts with standard test bars. Results obtained indicated that using the root area gives artificially high values, and if the pitch area is used the resulting diameters is the most accurate basis, and is well known and recognized as a standard. On mean area basis, the values for tensile strength agree closely with standard hardness—tensile strength conversion tables.

In the past, when softer steels were used for bolts, either tensile or yield strength served equally well as a basis of design. Yield strength was always taken as approximately half of the tensile strength. This ratio does not hold good for higher strength bolts. As the hardness increases, the yield strength approaches the tensile strength until, as in Fig. 1-B, it reaches the same value. Of course, yield strength is a directly usable criterion of the load-carrying ability of a bolt. It is recommended that yield strength be specified and used as the



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basis for evaluating the strength or load-carrying ability of bolts.

Yield strength of a standard test bar may be measured in several ways. Most common method employs use of a stress-strain diagram. This differs from the load elongation diagram only in that the load is divided by the area of the test specimen and elongation is divided by the gage length. Since it is difficult to place gage marks on the threads of bolts, and because the elongation is restricted to a short distance along the threads, it is more convenient to use a load-elongation diagram than a stress-strain diagram.

Determining Yield Strength

Method recommended for determining yield strength from the load-elongation diagram is shown in Fig. 2. The yield point where the bolt stretches without increase in load, is easily seen in softer bolts (B). For the case where no definite yield point exists (A) the yield strength is considered to be the point at which the slope of the line is 2/3 of the original slope. To find this point graphically draw the line OY perpendicular to the abscissa at point of origin of the curve. Then draw line AB, perpendicular to OY, so that AB intersects the curve somewhere along its straight portion. Point B is located so CB is one half the distance AC. Then draw line OBF. Draw a line DE parallel to OF and tangent to the curve. Load represented by the point where DE is tangent to the curve is the yield strength of the bolt. To obtain it in pounds per square inch, this load is divided by the mean area.

Ductility is the ability to deform or stretch without cracking. It is important in threaded parts because some plastic flow is required to distribute stress, and compensate for misalignment. Ordinarily, the bolt is in tension while the nut is in compression, causing stresses to concentrate on one thread more than others. Unless sufficient ductility is available, the bolt will break at this point with a sudden, brittle fracture. In most cases of eccentric loading, the bending stress may cause failures in brittle bolts.

On the standard tensile test specimen, ductility is measured by per cent elongation or per cent reduction of area. In the load-elongation diagram, ductility is indicated by amount of plastic elongation —that is the horizontal distance between the yield and breaking point. Standards for each bolt diameter are necessary because smaller bolts have less elongation. All diagrams shown are for bolts having ½-in. NC threads.

It is important to have a sufficient number of threads of the bolt engaged in the nut or testing fixture to prevent thread stripping. On the other hand, a sufficient number of threads must be exposed between the leave-off of the thread and the nut or testing fixture. Fig. 3 shows effect of the number of threads exposed on the strength and ductility values obtained. It may be seen that higher strength and lower ductility values are produced when a bolt is tested with no threads exposed. There is not much difference in strength values when the bolt is tested with from 3 to 10 threads exposed, but the ductility values continue to increase. It is recommended that when testing bolts, exactly three full threads be exposed between the nut or fixture and leave-off of the thread.

Recommendations made in the preceding paragraphs may be summarized briefly as follows:

1. Full-size bolts rather than standard test specimens should be tested where possible.
2. There should be three threads exposed between nut or testing fixture and leave-off of thread when testing bolts.
3. Yield strength should be used as the basic measure of bolt strength.
4. Yield strength and elongation should be measured on a load-elongation diagram.
5. When expressing yield or tensile strength in pounds per square inch, area used should be the mean rather than the root area.

Flux-Coated Bronze Rod Speeds Up Welding

A new flux-coated bronze welding rod for application by oxy-acetylene process is reported by The Linde Air Products Co., unit of Union Carbide & Carbon Corp., 30 East 42nd street, New York. Known as Oxweld No. 25M, it is said to combine all properties of bare bronze rod with correct fluxing.

Coating consists of flux and a nonactive binder which manufacturer says does not affect the weld, but adheres firmly to the rod, melting down without burning off ahead of the rod. The rod, it is said, can be heated and bent without destroying the coating, which also is unaffected by weather conditions.

Flux-coating rod reportedly speeds up welding operation, eliminating the usual delay of dipping end of hot rod into flux.

—o—

Description of coal processing equipment and techniques is the subject of new 66-page illustrated book published by McNally-Pittsburgh Mfg. Corp., Pittsburg, Kans. Entitled "New Horizons for Coal," volume explains design and operation of automatic separators, washers, dryers, breakers, crushers and conveying systems used in modern coal preparation plants.

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The Business Trend

Production Approaches New Postwar High Marks

INDUSTRIAL PRODUCTION is nearing new postwar high levels as automobile output gains momentum. After a lull in the Fourth of July holiday week, industrial activity in the week ended July 13 showed its strength by bounding back to 141 per cent (preliminary) on STEEL's index, only one point below the postwar high of 142 per cent in the week ended June 29.

Continued uptrend of the index will come largely from gains in automobile production, for the other three factors in the index, steel ingot production, freight carloadings and electric power output, are already at high levels and have less room to increase.

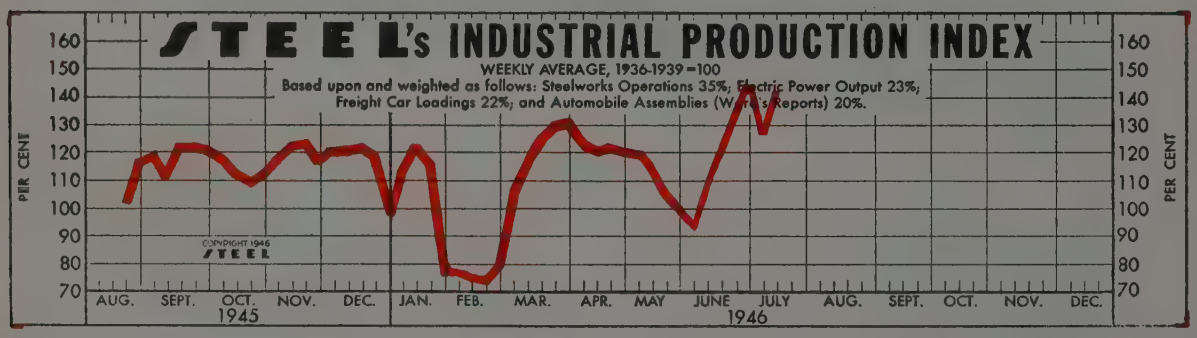
PRICES—As all businessmen ponder the extent to which inflation will develop, the U. S. Bureau of Labor Statistics record for the first week after government price control expired shows that primary market prices as a whole advanced 4 per cent, but that most of the rise was on farm products. Average prices of farm products jumped 9 per cent but for commodities other than farm products and foods the increase was only 0.9 per cent. The rise pushed the Bureau's all-commodity index to 117.2 per cent, highest level since December, 1920, and more than 11 per cent higher than at the end of the war.

FREIGHT CAR SHORTAGE—Expanding peacetime industrial production will face the handicap in September and October of a railroad car shortage which the Office of Defense Transportation predicts will be more serious than any encountered during the war. While box car loadings are exceeding highest wartime figures, the supply of serviceable box cars has decreased to less than 690,000, a loss of 33,000 since April, 1945. It is estimated that more than 300,000 of the nation's 1,770,000 freight cars of all kinds have passed the point at which they normally would have been retired. Meanwhile, shortages of lumber, steel and other materials prevent the building of enough cars to maintain the required number of replacements.

CASTINGS—May shipments of malleable iron castings aggregated 62,540 tons, down 2470 tons from April. Also down were new orders booked (less cancellations) for sale to the trade, their total for May being 37,211 tons, compared with 48,126 tons in April.

COKE—Lack of coking coal during the recent coal miners' strike cut May coke production severely. Output of by-product totaled 2,572,028 tons, compared with 3,851,824 in April, and production of beehive amounted to only 19,664 tons, compared with 24,331 tons in April. The by-product industry's May production rate was only 42 per cent of capacity, lowest since May, 1939, and beehive production was at the lowest figure on record.

MANUFACTURING—The uptrend in industrial activity is reflected in the U. S. Commerce Department's index of manufacturers' orders, shipments and inventories of durable goods for May. New orders rose four index points, shipments advanced five points, and inventories increased three points.



The Index (see chart above): Latest Week (preliminary) 141 Previous Week 126 Month Ago 128

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)§	86	88	75	90
Electric Power Distributed (million kilowatt hours)	4,156	3,741	4,030	4,295
Bituminous Coal Production (daily av.—1000 tons)	1,093	1,991	2,108	1,342
Petroleum Production (daily av.—1000 bbls.)	4,934	4,905	4,961	4,944
Construction Volume (ENR—Unit $1,000,000)	$150.6	$123.5	$138.9	$49.0
Automobile and Truck Output (Ward's—number units)	72,995	45,175	50,206	16,500

*Dates on request. §1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

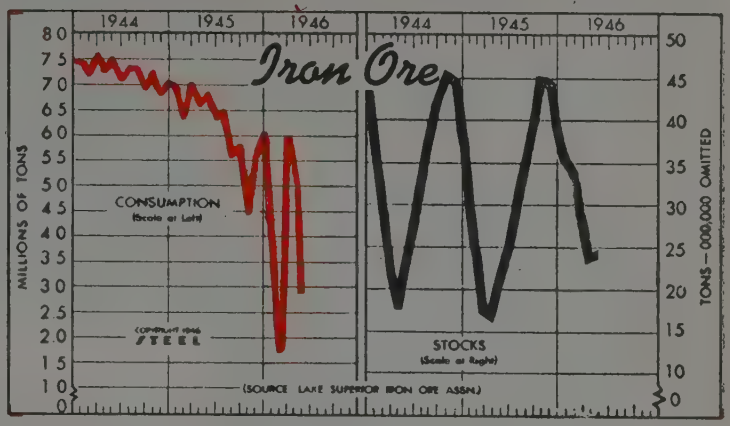
TRADE				
Freight Carloadings (unit—1000 cars)	869†	680	868	883
Business Failures (Dun & Bradstreet, number)	15	13	12	25
Money in Circulation (in millions of dollars)†	$28,335	$28,395	$28,128	$26,932
Department Store Sales (change from like wk. a yr. ago)‡	+26%	+38%	+39%	+15%

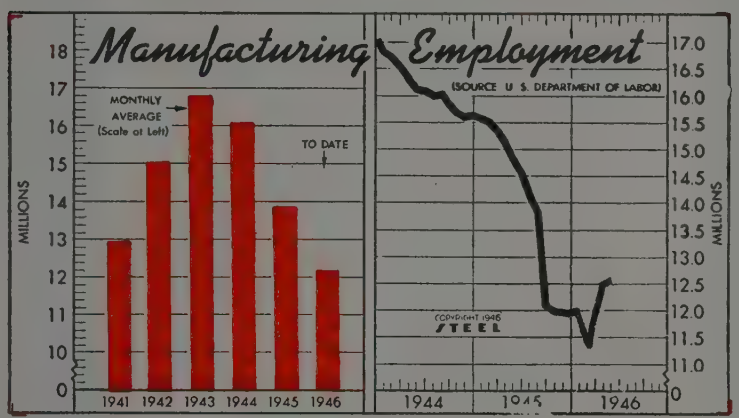
†Preliminary. ‡Federal Reserve Board.

Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and furnaces	
	1946	1945	1946	1945
Jan.	3,719	6 983	35.342	30,889
Feb.	1.748	6 371	33.647	24,577
Mar.	6.021	7.082	27.601	17,304
Apr.	4,769	6.642	23 079	16,429
May	2,980	6.872	23,905	20,715
June	....	6,397	.....	24,847
July	....	6 532	.....	29,485
Aug.	....	5,658	.....	34,781
Sept.	....	5,837	.....	39,549
Oct.	....	4,491	.....	45.090
Nov.	....	5.611	.....	44.706
Dec.	....	6,099	.....	39,059
Total	....	74,576	.....	.....





Factory Employment

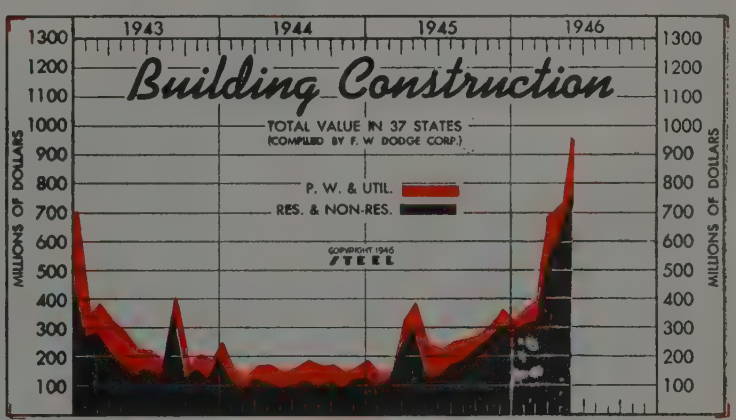
(000 omitted)

	1946	1945	1944
January	12,038	15,555	16,825
February	11,393	15,517	16,735
March	12,014	15,368	16 559
April	12,551	15,102	16,309
May	12,645	14,811	16,122
June	. ...	14,538	16,093
July	.....	14,130	16,013
August	.....	13,831	16,023
September	.....	12,097	15,843
October	.....	11,941	15,692
November	.....	11,947	15,607
December	.....	11,914	15,632
Monthly Ave.	.....	13,896	16,121

Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works-Utilities		Residential and Non-Residential	
	1946	1946	1945	1946	1945
Jan.	357.5	50 2	39.8	307.3	101.2
Feb.	387 4	64.7	32.0	322.7	115.0
Mar.	697 6	143.6	90.6	554.0	238.3
Apr.	734.9	128.1	111.9	606.8	283.9
May	952.4	197.9	107.9	754.6	134.6
June	....	....	95.0	....	100 3
July	....	....	89.9	....	167.8
Aug.	....	....	77.5	....	100.1
Sept.	....	....	54.6	....	223.6
Oct.	....	....	61.1	....	255 5
Nov.	....	....	74.0	....	296.0
Dec.	....	....	51.0	....	279.7
Tot'l	....	....	885.3	....	2,414.0



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$10,730	$14,204	$11,395	$11,656
Federal Gross Debt (billions)	$268.2	$267.8	$271.2	$261.5
Bond Volume, NYSE (millions)	$17.8	$13.8	$25.3	$27.8
Stocks Sales, NYSE (thousands)	4,501	3,459	5,192	4,478
Loans and Investments (billions)†	$61.0	$61.7	$63.3	$64.3
United States Gov't. Obligations Held (millions)†	$42,748	$43,437	$45,222	$47,122

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$64.45	$64.45	$64.45	$58.27
All Commodities†	117.2	112.7	111.5	105.8
Industrial Raw Materials†	135.2	126.7	125.5	118.3
Manufactured Products†	110.9	107.8	106.6	102.0

†Bureau of Labor Statistics Index, 1926 = 100.

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Scrap Famine Threatens To Cut Back Steel Production

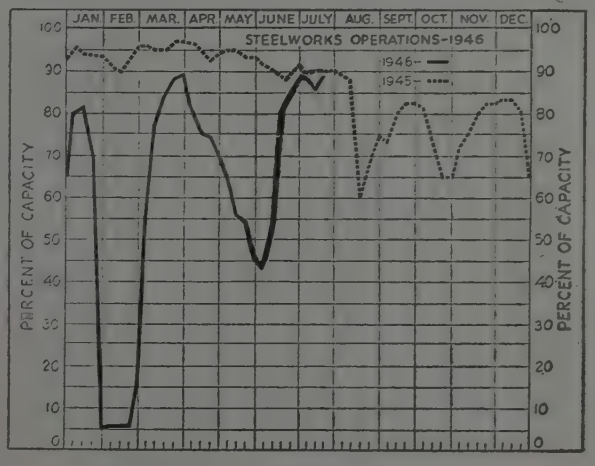
Some open hearths off, with others to follow . . . Preference tonnage continues to push back earlier orders . . . Steel prices hold

SCRAP scarcity is assuming a more portentous aspect, some observers predicting that unless supply is increased soon steelmaking will be radically reduced. With all inventories low, some melters are operating on supplies received from day to day. Predictions of possible steelmaking reduction range as high as 50 per cent of capacity though this seems extreme. Some open hearths already have been taken off and others will follow soon.

As a remedy efforts are under way to increase shipbreaking of government-owned craft at a faster rate than formerly planned and also to expedite movement of scrap material in the hands of various government agencies. In addition, a campaign is under way to collect rural scrap and to hasten wrecking of automobiles in auto graveyards. Undoubtedly some scrap is being held back in hope of higher prices if OPA is not revived. Definite decision on this point might bring out appreciable tonnages at once.

Except for the break-through of cast scrap, prices are holding to former OPA ceilings, with the exception of occasional small lots perhaps bringing higher prices. Such transactions are on the fringe of the market and do not represent much tonnage.

Mills continue to find revision of schedules necessary to accommodate preference tonnages to aid housing and agricultural implement manufacture. Most of this tonnage is for September and the question has arisen whether the provisions of Direction 12 may be extended to fourth quarter as well. While the certified tonnage is not heavy it interferes with plans and disrupts schedules of steel mills as well as depriving other consumers of material on which they had planned their schedules.



DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended July 20	Change	Same Week 1945	Same Week 1944
Pittsburgh	89	+ 9	86.5	90
Chicago	91	+ 3	94	101
Eastern Pa.	85	None	87	95
Youngstown	87	None	90	95
Wheeling	81.5	—7.5	96.5	100
Cleveland	87	— 2	86	92
Buffalo	88.5	None	88.5	90.5
Birmingham	99	None	95	95
New England	85	+30	86	90
Cincinnati	77	None	96	86
St. Louis	54.5	None	70	79.5
Detroit	83	— 5	83	83
Estimated national rate	88	+ 2	90	93

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

Steel prices are holding at OPA ceilings, with no indication of any material change until the fate of OPA has been decided. It is possible some upward revisions may appear soon, possibly through extras in some cases, in some marginal products on which production has been low for some time.

Pig iron suppliers are feeling the effect of certified tonnage for third and fourth quarters and melters not engaged in production of materials for housing and agricultural implements will suffer cuts in their shipments. Pig iron output is increasing somewhat as additional furnaces are made active, but total supply is far short of needs and is being spread thinly to serve as many users as possible. Prices have not been raised since the advance by two southern producers, other makers awaiting outcome of price control action by Congress.

Much interest is attached to purchase by the British Supply Mission of more than 60,000 tons of sheet bars from an Ohio river mill, on which rolling was started last week. Firm prices apply to 30,000 tons and the remainder will be at price in effect at time of shipment.

Steelmaking operations last week regained the 2 points lost the prior week by a strike at Pittsburgh, the estimated national rate reaching 88 per cent of capacity. Pittsburgh rose 9 points to 98 per cent from a revised rate of 89 the previous week, Chicago advanced 3 points to 91 and New England gained 30 points to 85 per cent as important steelmakers resumed after vacations. Wheeling dropped 7½ points to 81½, Detroit 5 points to 83 and Cleveland 2 points to 87. Rates were unchanged as follows: Cincinnati 77, Birmingham 99, Youngstown 87, eastern Pennsylvania 85, St. Louis 54½, Buffalo 88½, West Coast 84.

Average composite prices of steel and iron products are unchanged from last week, producers holding the line at former OPA ceilings while Congress struggles with the problem of reviving that agency. Finished steel composite is $64.45, semifinished steel $40.60, steelmaking pig iron $25.75 and steelmaking scrap $19.17.

COMPOSITE MARKET AVERAGES

	July 20	July 13	July 6	One Month Ago June, 1946	Three Months Ago April, 1946	One Year Ago July, 1945	Five Years Ago July, 1941
Finished Steel	$64.45	$64.45	$64.45	$64.09	$63.54	$58.27	$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	25.75	25.75	25.50	25.50	25.50	24.00	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others dollars per gross ton.

Finished Material

	July 20, 1946	June, 1946	Apr., 1946	July, 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.82	2.82	2.57
Steel bars, Chicago	2.50	2.50	2.50	2.25
Shapes, Pittsburgh	2.35	2.35	2.35	2.10
Shapes, Philadelphia	2.48	2.465	2.465	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.558	2.55	2.55	2.30
Plates, Chicago	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh	3.75	3.55	3.25	2.90
Tin plate, per base box, Pittsburgh	$5.25	$5.25	$5.25	$5.00

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$38.00	$38.00	$38.00	$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	2.30c	2.30c	2.30c	2.15c

Pig Iron

	July 20, 1946	June, 1946	Apr., 1946	July, 1945
Bessemer del. Pittsburgh	$27.69	$27.69	$27.69	$26.19
Basic, Valley	26.00	26.00	26.00	24.50
Basic, eastern del. Philadelphia	27.93	27.84	27.84	26.34
No. 2 fdry., del. Pgh. N. & S. sides	27.19	27.19	27.19	25.69
No. 2 foundry, Chicago	26.50	26.50	26.50	25.00
Southern No. 2, Birmingham	24.88	22.88	22.88	21.38
Southern No. 2 del. Cincinnati	28.94	26.94	26.94	25.44
No. 2 fdry., del. Philadelphia	28.43	28.34	28.34	26.84
Malleable, Valley	26.50	26.50	26.50	25.00
Malleable, Chicago	26.50	26.50	26.50	25.00
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. Pittsburgh	26.69	26.69	26.69	25.19
Ferromanganese, del. Pittsburgh	140.00	140.00	140.00	140.33

Scrap

Heavy melting steel, No. 1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke

Connellsville, furnace ovens	$8.75	$7.50	$7.50	$7.50
Connellsville, foundry ovens	9.50	8.25	8.25	8.25
Chicago, by-product fdry., del.	15.10	13.75	13.75	13.35

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Fob mill base, rerolling quality, standard analysis, $33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41; Duluth (billets), $41; Pac. ports (billets), $51. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co., $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49; Duluth, billets, $49; forging billets fob Pac. ports, $59.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 fob Toronto, O.; Geneva Steel Co., $64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $58.43; del. Detroit $60.43; eastern Mich. $61.43.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—$\frac{9}{32}$ in. inclusive, per 100 lb, $2.30. Do., over $\frac{9}{32}$—$\frac{47}{64}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.50.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.84c; Phila., del., 2.86c; Gulf ports, dock, 2.85c; Pac. ports, dock, 3.15c. (Sheffield Steel Corp. may quote 2.75c, fob St. Louis; Joslyn Mfg. & Supply Co., 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars; Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.021c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.108	4300	$1.839
2300	1.839	4600	1.298
2500	2.759	4800	2.326
3000	0.541	5100	0.379
3100	0.920	5130 or 5152	0.494
3200	1.461	6120 or 6152	1.028
		6145 or 6150	1.298
3400	3.462	8612	0.703
4000	0.487	8720	0.757
4100 (.15-.25 Mo)	0.757	9830	1.407
(.20-.30 Mo)	0.812		

* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.725c, eastern Mich., 3.755c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich. del., 2.575c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 2.975c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.60c. on hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del., 3.425c; New York, del., 3.615c; Phila., del., 3.635c; Pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.60c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.60c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to lengths, 9.00c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	.....
65	7.625c	8.375c	.....
58	8.125c	8.875c	.....
52	8.925c	9.675c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (Superior Steel Corp. may quote 3.20c, Pitts.)

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., del., 3.20c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box, 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point; $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb $12.50; 15-lb $14.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.)

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, 2.74c; Boston, del., 2.86c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c fob D.P.C. mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

Clad Steel Plates: Coatesville, 10% cladding: nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c, Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

Wire to Manufacturers in carloads

Bright basic or bessemer	•$3.05
Spring (except Birmingham)	•$4.00

Wire Products to Trade

Nails and staples

Standard and cement-coated	†$3.75
Galvanized	††$3.40

Wire, Merchant Quality

Annealed	§$3.50
Galvanized	§$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Adjustments Pend

Delivered prices quoted on these pages are subject to upward revision in line with the Interstate Commerce Commission's order authorizing an increase in railroad freight rates, effective as of July 1. The order authorized a general 6 per cent increase with certain exceptions.

Woven fence, 15½ gage and heavier	72
Barbed wire, 80-rod spool	79
Barbless wire, twisted	79
Fence posts	74
Bale ties, single loop	72½

•Add $0.10 for Worcester, $0.05 for Duluth and $0.50 for Pacific ports.

†Add $0.30 for Worcester. $0.50 for Pacific ports. Nichols Wire & Steel may quote $4.25.

††Add $0.50 for Pacific ports.

§Add $0.10 for Worcester, $0.70 for Pacific ports.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	53	30	½	21	0½
¼ & ⅜	56	37½	¾	27	7
½	60½	48	1-1¼	31	13
¾	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Elec. Weld— Hot Rolled	Cold Rolled
1"	13	.....	$9.90	$9.36	$9.65
1¼"	13	.....	11.73	9.63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15.06	18.03
2½"	12	17.07	20.28	16.57	19.83
2¾"	12	18.70	22.21	18.11	21.68
3"	12	19.82	23.54	19.17	22.95
3½"	12	20.79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38 68	31.32	37.52
4½"	9	43.16	51.29	.....	.....
5"	9	49.96	59.36	.....	.....
6"	7	76.71	91.14	.....	.....

Pipe, Cast Iron: Class B, 6-in. and over, $54 per net ton, Birmingham; $62, Burlington, N. J.; $62.80, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 4.75c; heat treated, 5.00c. Tie plates $51 net ton, base, Standard spikes, 3.65c.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; Reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W.	Cr.	V.	Mo.	Base per lb.
18.00	4	1	...	72.49c
1.5	4	1	8.5	58.43c
.....	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 12 per cent, effective July 1, 1946; discounts remain unchanged.)

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅞ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-in. and smaller	..	64
½-in. and smaller	62	..
½-in.-1-in.	..	60
⅝-in.-1-in.	59	..
1⅛-in.-1½-in.	57	58
1⅝-in. and larger	56	..

Additional discount of 10 for full kegs.

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset 1-in. and smaller	71 off
Headless, ¼-in. and larger	60 off
No. 10 and smaller	70 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
⅞-inch and under	65-5 off

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

Stainless Steels

Base, Cents per lb

CHROMIUM NICKEL STEELS

	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.59
312	38.95	43.28	53.02	.....	.....
•316	43.28	47.61	51.94	43.28	51.94
§321	31.38	36.79	44.36	31.65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35

STRAIGHT CHROMIUM STEEL

403	23.93	26.51	31.92	22.99	29.21
••410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
‡‡430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25 70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.49	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)

(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	....	19.48	20.56	....	....
410	....	17.31	18.39	....	....
430	....	17.85	18.94	....	....
446	....	19.48	20.56	....	....

• With 2-3% molybdenum. § With titanium. † With columbium. •• Plus machining agent. †† High carbon. ‡‡ Free machining.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	•$8.75
Connellsville, foundry	9.25- 9.75
New River, foundry	9.00- 9.25
Wise county, foundry	7.75- 8.25
Wise county, furnace	7.25- 7.75

By-Product Foundry

Kearney, N. J. ovens	14.40
Chicago, outside delivered	14.35
Chicago, delivered	15.10
Terre Haute, delivered	14.85
Milwaukee, ovens	15.10
New England, delivered	16.00
St. Louis, delivered	†15.18
Birmingham, delivered	12.25
Indianapolis, delivered	14.85
Cincinnati, delivered	14.60
Cleveland, delivered	14.55
Buffalo, delivered	14.75
Detroit, delivered	15.10
Philadelphia, delivered	14.63

•Operators of hand-drawn ovens using trucked coal charge $9.35.

†15.68 from other than Ala., Mo., Tenn.

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946.

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold finished bars	Cold-rolled strip
Boston	4.356[1]	4.203[1]	4.203[1]	6.039[1]	4.050[1]	5.548[1]	4.418[1]	5.725[14]	5.031[14]	4.656[21]	4.965
New York	4.103[1]	4.038[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.838[14]	4.553[21]	5.075
Jersey City	4.155[1]	4.018[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.890[14]	4.605[21]	5.075
Philadelphia	4.114[1]	3.937[1]	3.875[1]	5.564[1]	3.774[1]	4.664[1]	4.554[1]	5.499[1]	5.139[26]	4.564[21]	5.064
Baltimore	4.093[1]	4.05[1]	3.865[1]	5.543[1]	3.64[1]	4.293[1]	4.193[1]	5.365[17]	5.118[26]	4.543[21]	.....
Washington	4.232[1]	4.22[1]	4.067[1]	5.632[1]	3.842[1]	4.432[1]	4.332[1]	5.667[17]	5.007[24]	4.532[21]	.....
Norfolk, Va.	4.377[1]	4.303[1]	4.262[1]	5.777[1]	4.037[1]	4.927[1]	4.477[1]	5.862[17]	4.552[24]	4.677[21]	.....
Bethlehem, Pa.*		3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.*		.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*		.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60[1]	3.65[1]	3.92[1]	5.55[1]	3.575[1]	4.21[1]	4.11[1]	5.20[25]	4.625[16]	4.20[21]	4.96
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[21]	4.525[16]	4.10[21]	4.90
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.575[1]	3.95[1]	3.850[1]	5.327[13]	4.625[24]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[24]	4.10[21]	4.60
Cleveland (city)	3.60[1]	3.88[1]	3.65[1]	5.48[1]	3.575[1]	3.95[1]	3.850[1]	5.347[13]	4.625[24]	4.20[21]	4.70
Cleveland (country)	3.50[1]	.....	3.55[1]	.....	3.475[1]	3.85[1]	3.750[1]	.....	4.525[24]	4.10[21]	4.60
Detroit	3.70[1]	3.952[1]	3.90[1]	5.572[1]	3.675[1]	4.050[1]	3.950[1]	5.491[13]	4.725[24]	4.25[13]	4.95
Omaha (city, del.)	4.32[1]	4.37[1]	4.37[1]	5.97[1]	4.035[1]	4.53[1]	4.43[1]	6.00[15]	5.72[24]	4.945[21]	.....
Omaha (country)	4.22[1]	4.27[1]	4.37[1]	5.87[1]	3.935[1]	4.43[1]	4.33[1]	5.90[15]	.....	.....	.....
Cincinnati	3.902[1]	3.983[1]	3.952[1]	5.583[1]	3.671[1]	4.046[1]	3.946[1]	5.296[15]	4.271[24]	4.602[21]	.....
Youngstown*	.....	.....	.....	.....	.....	.....	.....	4.85[22]	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.475[1]	3.85[1]	3.750[1]	5.10[15]	.....	.....	4.90
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[1]	3.475[1]	3.95[1]	3.850[1]	†5.40[15]	4.425[24]	4.20[21]	5.058
Milwaukee	3.908[2]	3.958[1]	3.958[1]	5.558[1]	3.633[1]	4.108[1]	4.008[2]	†5.558[15]	4.583[24]	4.358[21]	5.058
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.743[4]	4.118[4]	4.018[4]	5.368[15]	4.793[24]	4.43[21]	5.058
St. Paul	4.072[2]	4.122[2]	4.122[2]	5.722[1]	3.797[1]	4.279[1]	4.172[1]	5.635[15]	4.747[24]	4.811[2]	5.849
St. Louis	3.918[1]	3.968[1]	3.968[1]	5.568[1]	3.643[1]	4.118[11]	4.018[1]	5.622[15]	4.593[24]	4.552[21]	5.222
Memphis, Tenn.	4.265[1]	4.315[1]	4.315[1]	6.03[1]	4.190[1]	4.565[1]	4.465[1]	5.715[15]	5.005[24]	4.78[21]	.....
Birmingham	3.75[1]	3.80[1]	3.80[1]	6.153[1]	3.675[1]	4.05[1]	4.05[1]	5.20[15]	5.077[24]	4.99[21]	5.465
New Orleans (city)	4.358[1]	4.408[1]	4.408[1]	6.320[1]	4.283[1]	4.658[1]	.....	5.808[15]	5.304[24]	5.079[21]	.....
Houston, Tex.	4.00[8]	4.50[1]	4.50[1]	5.75[9]	3.988[8]	4.663[9]	4.563[9]	5.763[26]	5.819[10]	4.10[23]	.....
Los Angeles	4.65[4]	4.90[4]	5.20[4]	7.45[4]	5.225[4]	5.30[4]	5.200[4]	6.55[13]	7.425[4]	6.033[21]	5.863
San Francisco	4.20[7]	4.15[7]	4.15[7]	5.85[7]	4.125[7]	5.35[7]	4.50[7]	6.35[13]	6.875[13]	5.783[21]	7.588
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.875[27]	6.65[27]	5.000[27]	6.20[15]	6.825[13]	5.983[15]	.....
Tacoma, Wash.	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[13]	6.23[21]	.....
Seattle	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[13]	6.23[21]	.....

* Basing point cities with quotations representing mill prices, plus warehouse spread; † open market price.

BASE QUANTITIES

[1]—400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles.. [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.45
Mesabi nonbessemer	5.05
High phosphorus	5.05
Mesabi bessemer	5.20
Old range nonbessemer	5.30

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	18.00

Foreign Ore

Cents per unit, cif Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68%	Nom.
Spanish, N. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1 less $7 freight allowance.	$43.50

Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 10c per unit less than Metal Reserve prices.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Designation	Chemical Composition Limits, Per Cent—Carbon	Mn	Si	Cr	Ni	Mo	Basic open-hearth Bars per 100 lb.	Billets per GT	Electric furnace Bars per 100 lb.	Billets per GT
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	$0.812	$16.230	$1.353	$27.050
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.132
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542

Extras are in addition to a base price of 2.921c, per pound on finished products and $58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Prices per gross ton. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$27.50	$27.00	$28.50	$28.00
Newark, N. J., del.	29.20	28.70	30.20	29.70
Brooklyn, N. Y., del.	30.28	.....	.....	30.78
Birdsboro, Pa., base	27.50	27.00	28.50	28.00
Birmingham, base	22.88-26.88	21.50-25.50	27.50	.....
Baltimore, del.	28.22-32.22	.....	.....	.....
Boston, del.	27.68-31.68	.....	.....	.....
Chicago, del.	26.72-30.72	.....	.....	.....
Cincinnati, del.	26.94-30.94	26.06-30.06	.....	.....
Cleveland, del.	26.62-30.62	25.74-29.74	.....	.....
Newark, N. J.	28.82-32.82	.....	.....	.....
Philadelphia, del.	28.05-32.05	27.55-32.55	.....	.....
St. Louis, del.	26.62-30.62	27.54-31.54	.....	.....
Buffalo, base	26.50	26.50	27.50	27.00
Boston, del.	28.00	27.00	29.00	28.50
Rochester, del.	28.03	.....	29.03	28.53
Syracuse, del.	28.58	.....	29.58	29.08
Chicago, base	26.50	26.00	27.00	26.50
Milwaukee, del.	27.60	27.10	28.10	27.60
Muskegon, Mich., del.	27.69	.....	.....	27.69
Cleveland, base	26.50	26.00	27.00	26.50
Akron, Canton, del.	28.04	27.54	28.54	28.04
Detroit, base	26.50	26.00	27.00	26.50
Saginaw, Mich., del.	28.81	28.31	29.31	28.81
Duluth, base	27.00	26.50	27.50	27.00
St. Paul, del.	29.13	28.63	29.63	29.13
Erie, Pa., base	26.50	26.00	27.50	27.00
Everett, Mass., base	27.50	27.00	28.50	28.00
Boston, del.	28.06	27.56	29.06	28.56
Granite City, Ill., base	26.50	26.00	27.00	26.50
St. Louis, del.	27.00	26.50	.....	27.00
Hamilton, O., base	26.50	26.00	....	26.50
Cincinnati, del.	27.68	27.18	.....	27.68
Neville Island, Pa., base	26.50	26.00	27.00	26.50
*Pittsburgh, del. N. & S. sides	27.19	26.69	27.69	27.19
Provo, Utah, base	24.50	24.00	.....	.....
Sharpsville, Pa., base	26.50	26.00	27.00	26.50
Sparrows Point, base	27.50	27.00	...	.....
Baltimore, del.	28.60	.....	.....	.....
Steelton, Pa., base	...	27.00	...	...
Swedeland, Pa., base	27.50	27.00	28.50	28.00
Philadelphia, del.	28.43	27.93	.....	28.93
Toledo, O., base	26.50	26.00	27.00	26.50
Youngstown, O., base	26.50	26.00	27.00	26.50
Mansfield, O., del.	28.66	28.16	29.16	28.66

*To Neville Island base add: 55 cents for McKees Rocks, Pa.; 84 cents, Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97 cents (water), Monongahela; $1.11, Oakmont, Verona; $1.24, Brackenridge.

Exception to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron.

High Silicon, Silvery

6.00-6.50 per cent (base) $32.00

6.51-7.00	$33.00	9.01- 9.50	38.00
7.01-7.50	34.00	9.51-10.00	39.00
7.51-8.00	35.00	10.01-10.50	40.00
8.01-8.50	36.00	10.51-11.00	41.00
8.51-9.00	37.00	11.01-11.50	42.00

Fob Jackson county, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01 to 14.50%, $48 Jackson co.; each additional 0.50% silicon up to and including 18% add $1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add $1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn., $33.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $26.00
Valley base 26.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $32.00 base; $33.38, del. Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $29.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Refractories

Per 1000, fob shipping point. Net prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $76.05

High Heat Duty

Pa., Ill., O., Md., Mo., Ky. 60.40
Ala., Ga. 60.40
N. J. 65.90

Intermediate Heat Duty

Ohio 50.60
Pa., Ill., Md., Mo., Ky. 54.80
Ala., Ga. 49.15
N. J. 57.65

Low Heat Duty

Pa., Md., Ohio 42.35

Malleable Bung Brick

All bases 70.40

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press 36.45
Wire Cut 34.15

Silica Brick

Pennsylvania 60.40
Joliet, E. Chicago 69.30
Birmingham, Ala. 60.40

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.
Bulk 22.00
Bags 26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick 54.00
Chem. bonded chrome 54.00
Magnesite brick 76.00
Chem. bonded magnesite 65.00

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

Ferroalloy Prices

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c; central 81c and 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices up 10 cents.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; **high carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l., and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points. **Low carbon, high nitrogen:** Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Special Foundry Ferrochrome (Cr 62-66%, C about 5-7%): Contract, lump, packed, eastern zone, freight allowed, c.l. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, high carbon (Cr 60-65%, Si, Mn and C 4-6% each): Contract, lump, packed, eastern zone, freight allowed, c.l. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S.M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

SMZ Alloy: (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

Silvaz Alloy: (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up 0.25c.

CMSZ Alloy 4: (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

CMSZ Alloy 5: (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c, 13.00c, central; 13.25c, 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max and C 0.50% max.) per lb of alloy contract ton lots $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.90, less $2.01, eastern; freight allowed; $1.903 and $2.023, central; $1.933 and $2.055 western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, $1.90, 1 ton to 5 tons, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity 48c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Vanadium Oxide: (Fused: Vanadium oxide 85-88%, sodium oxide approx. 10% and calcium oxide approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx

2.5%) Contract, any quantity $1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, $1.105, less carlots, $1.108, central; $1.118 and $1.133, western; spot and 5c to contracts in all cases.

Calcium metal; cast: Contract ton lots or more $1.35, less, $1.60, pound of metal; $1.36 and $1.61 central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, carlot, lump 13.00c, ton lots 14.50c, less 15.50c, eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

Briquets Ferromanganese: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Briquets, Ferrochrome: Containing exactly 2 lb Cr, packed, eastern zone, c.l. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

Silicomanganese, containing exactly 2 lb Mn and about ½ lb Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon,** weighing about 5 lb and containing exactly 2 lb Si, or about 2½ lb and containing exactly 1 lb Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are f.o.b. shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Ferromolybdenum: 55-75% per lb contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher. Deduct 0.85c for bulk carlots.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 98% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

Tungsten Metal Powder: Spot, not less than 97%, $2.50-$2.60; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

High-Carbon Ferrotitanium: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Bortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Ferrovanadium: Va 35-55%, contract basis, per lb contained Va, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Zirconium Alloys: Zr 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up $5 per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up ½c.

Siminal: (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

Borosil: 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25

Cast Grades

(Fob Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices)

No. 1 Heavy Melt. Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstripped Motor Blocks	17.50
Stove Plate	19.00

BOSTON:

(Fob shipping points. Boston differential 99c higher, steelmaking grades; Providence, $1.09 higher)

No. 1 Heavy Melt. Steel	$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.31
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

BUFFALO:

(Delivered consumers' plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
No. 1 Cast	25.00
Low Phos.	21.75

PITTSBURGH:

(Delivered consumers' plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	*20.00
Heavy Breakable Cast.	*16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

* Shipping point.

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD:

(Delivered consumer's plant)

Machine Shop Turnings	$15.00

CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shoveling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-22.00
Scrap Rails	20.50-21.00
Stove Plate	18.50-19.00

DETROIT:

(Delivered consumer's plant)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

CHICAGO:

(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)

No. 1 R.R. Heavy Melt.	$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dir. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	11.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Rerolling Rails	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

ST. LOUIS:

(Delivered consumer's plant; cast grades fob shipping point)

Heavy Melting	$17.50
No. 1 Locomotive Tires	21.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shoveling Turnings	12.50
Rerolling Rails	21.00
Street Car Axles	24.50
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Cupola Cast	20.00
Charging Box Cast	19.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Grate Bars	15.25
Brake Shoes	15.25

BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	$22.50
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	11.00
Cast Iron Borings	13.00
Iron Car Wheels	20.00

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Dir. Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1, No. 2 Bundles	17.00
No. 3 Bundles	9.00
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut, Structural, Plate 1 ft and under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.50
No. 2 Steel Wheels	21.50
Iron, Steel Axles	24.00
No. 2 Cast Steel	20.50
Uncut Frogs, Switches	18.00
Scrap Rails	18.50
Locomotive Tires	20.50

SEATTLE:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.12
No. 2 Heavy Melt. Steel	14.12
Heavy Railroad Scrap	14.50

(Fob shipping point)

No. 1 Cupola Cast	20.00

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 15.25c; 88-10-2 (No. 215) 18.50c; 80-10-10 (No. 305) 18.00c; No. 1 yellow (No. 405) 12.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 9.50c, select 9.60c, brass special 9.75c, intermediate 10.00c, high grade 10.50c, E. St. Louis, for carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.40c; under 2000 lb 0.50c.

Lead: Common 9.35c, chemical 9.45c, corroding, 9.45c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland - Akron - Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston - Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 11.25c; No. 12 foundry alloy (No. 2 grade) 11.00-11.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 12.50c; grade 2 (92-95%) 11.50c; grade 3 (90-92%) 10.00-10.25c; grade 4 (85-90%) 9.50-9.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

Mercury: Open market, spot, New York, $101-$103 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms 90.00c lb, del.; anodes, balls, discs and all other special or patented shapes 95.00c per lb delivered.

Cobalt: 97-99%, $1.50 lb, for 550 lb (bbl.); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y. 70.625 per ounce.

Platinum: $67-$70 per ounce.

Palladium: $24 per troy ounce.

Iridium: $125 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 28.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

Rods: Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

Seamless Tubing: Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

Copper Wire: Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills, carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c, New York, 10.00c, Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

Zinc Products: Sheet fob mill, 13.15c; 36,000 lb and over deduct 7%; Ribbon and strip 12.25c, 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

Copper Anodes: In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

Copper Carbonate: 52-54% metallic Cu, 250 lb barrels 20.50c.

Copper Cyanide: 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

Sodium Cyanide: 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

Nickel Anodes: 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

Nickel Chloride: 100-lb kegs or 275-lb bbls 18.00c lb, del.

Tin Anodes: 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb bbls 39.00c fob Grasselli, N. J.; 100-lb kegs 39.50c.

Sodium Stannate: 100 or 300-lb drums 36.50c, del.; ton lots 35.50c.

Zinc Cyanide: 100-lb kegs or bbls 33.00c fob Niagara Falls.

Scrap Metals

Brass Mill Allowances: Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red brass			
85%	10.875	10.625	10.125
80%	10.875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Muntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	5.250
Phos. br., A, B, 5%	12.750	12.500	11.500
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lb of one group and ½c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-lined brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids: (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

Aluminum Scrap: Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

Lead Scrap: Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

Zinc Scrap: New clippings 7.25c, old zinc 5.75c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ½c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.80c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ½c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c per contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheets, Strip . . .

British Mission buys 60,000 tons sheet bars. Certified sheet tonnage crowds back other orders

Sheet & Strip Prices, Page 144

New York—British Supply Mission has purchased over 60,000 tons of sheet bars from an Ohio river mill through Charles A. Koons & Co., New York, of which 30,000 tons are booked at a firm price and the remainder at price in effect at time of shipment. The mill started rolling the bars last week.

Regardless of whatever the method used in scheduling, by month or quarter, certified tonnage for flat-rolled will set back considerable tonnage in both third and fourth quarters. Most of this volume will be for September delivery and every ton moved forward will be at the expense of a like quantity to some other consumer. Orders in this category are appearing for strip as well as sheets, with galvanized sheets leading, and some enameling and electrical sheets included. Tonnage displaced this quarter will for the most part extend a like volume in fourth and add to carryovers for first quarter. While certified orders affect existing volume already booked, for the most part, some are new additions and in several cases producers are asking for copies of the certification orders. Mills are turning down considerable new inquiry or holding orders in abeyance until scheduling can be done with some degree of stability.

Chicago—Congestion in sheets still occurs, despite higher mill operations, now almost normal. Consumers are pressing for early deliveries of material, although some are relaxing pressure in view of receipts and the knowledge that flat-rolled products will be a bottleneck for months. Mills are now finishing processing of certifications for August following the July 1 deadline, consequently the picture for next month is not clear.

Boston—Narrow cold strip production shows spotty improvement, but with hot-rolled inventories depleted and unbalanced, schedules are still uneven, pending heavier and better rounded supply. Numerous consumers of flat-rolled have sought and in many cases actually have more tonnage on mill books than ever before, but deliveries and inventories will have to be substantially larger before any multiple buying will be revealed. Lack of flatrolled is holding back production of new product programs in many cases and prevents an increase in output of established goods in others. In spots assembly lines are beginning to move at higher speed, but many are well below planned pace at this time. Some fabricators have evidently abandoned increased production plans and are more concerned in getting steel due them on old orders than in placing new ones.

Cleveland—Priority orders for sheets are causing some dislocation of mill schedules, making an already tight situation even more acute. A large portion of the priority orders is for galvanized, reflecting their destination into farm machinery and housing equipment. Some producers who have not filled fourth quarter books hope to use the leeway to absorb tonnage dislocated by certified orders, so that mills can end the year without carrying undelivered tonnage into 1947. Mills whose fourth quarter books had already been filled likely will find it necessary to carry over tonnage into first quarter. To obtain as much sheet steel as possible, a few consumers who have uncertified orders on books of their regular suppliers have tried to place certified orders with other suppliers, but the latter, already swamped with business, have declined the new business.

Philadelphia—By fourth quarter some easing in polished stainless sheets is likely as a result of substantial increase in polishing equipment at most producing mills. Several have materially increased commitments for fourth quarter. Stainless backlogs are heavy, with some indications fabricators have placed duplicate orders or possibly overbought. Certified tonnage covering galvanized and hot-rolled is heavier and will be a factor in revised schedules for September especially. While in the aggregate this tonnage is not large it is sufficient to cause confusion and opens speculation as to whether operation of Direction 12 might not be extended beyond third quarter if all requirements are not met by September. Both light-gage sheets and strip are being held down by requirements for tin plate, while narrow cold strip production is still handicapped by a limited and unbalanced flow of hot-rolled stock.

Pittsburgh—Sheet and strip production here is back to normal, but there is little prospect of substantial relief from the present critical tight supply through this year. Pressure for prompt delivery remains acute, with many metalworking companies operating below capacity due to depleted inventories. Steel is not the only short item in most instances, with scarcity of component parts said to be just as critical.

Birmingham — Some easing in pressure for sheets is apparent, probably because of impossibility of speeding deliveries. Mills expect, however, that the generally tight situation in flat-rolled steel is likely to continue indefinitely, probably a year at best. Fabricators generally are handicapped and general complaint is heard.

Cincinnati—Revision of third quarter schedules of district sheet mills is looming as the result of heavier tonnage being certified for housing and farm implements. The displacement of sheets destined for other purposes appears most serious for September deliveries. The Ashland, Ky., mills of American Rolling Mill Co. have resumed after a two-weeks shutdown to permit major repairs. Blast furnaces and open hearths maintained production, some of the steel being diverted to other rolling units.

Zinc Products Increased

Illinois Zinc Co., 2959 West 47th St., Chicago, announces that effective July 12 base prices on its sheet and strip zinc products are increased $2 per hundred pounds and on lithographers' sheets and foil base prices are increased $3 per hundred pounds.

Steel Bars . . .

Mill production near normal and consumers receiving better tonnage, though mill books are still loaded

Bar Prices, Page 144

Pittsburgh—Sellers report production now back to normal with result that many customers are getting relief and are able to step up production moderately. One large interest here reports that two or three auto partsmakers refused to take up their entire July allotment, because their production programs have been cut back and on the basis of present inventories and scheduled production for this month, adequate material was on hand.

Some district offices are taking on a little tonnage to balance out tonnage allotted them for the balance of this year; however, in most instances all tonnage allotted for distribution is more than represented by orders on hand. Full impact of certified orders under Direction 12 to M-21 on producers' schedules cannot as yet be estimated, except to the extent many customers' orders will be pushed further back. Cold finishers have some openings for larger sizes for fourth quarter, and some headway is currently being made against carryover tonnage now that full mill production has been resumed. Forge shops also are able to increase operations.

Chicago—Demand for steel bars continues to exceed mill shipments, and certifications for the agricultural implement industry, are higher than anticipated. There is a feeling among barmakers and flat-rolled producers in general that consumers are certifying more tonnage than they are entitled. Certifications for August, due to be in by July 1, are still being processed consequently the situation for next month can not yet be appraised. Some evidence is accumulating that there is considerable duplicate buying.

Philadelphia—Hot-rolled alloys are the only bar product approximating normal delivery, most producers quoting September. Carbon bar mills are filled through the year on small sizes for bolts, nuts, forgings and screw machine products. Some distributors have fair inventories of cold-finished bars and producers are getting hot stock in slightly better volume. Although there is some substitution of alloys for carbon on a delivery basis, the volume is not large. Bar consumers are hampered by unbalance in sizes and 8 and 10-inch mills are badly jammed. Bar demand has shifted sharply since cancellation of war contracts, eliminating shell steel and large tonnages of heavy stock.

Tin Plate . . .

Tin Plate Prices, Page 145

Pittsburgh—Producers are confident sufficient tin plate will have been produced to meet the domestic fruit pack program which will reach its peak this quarter, despite the loss of two months' output from the steel strike Tin plate interests, however, will be hard pressed meeting these requirements and will

succeed only if no further work stoppages occur. Possibility of relaxing some of the conservation measures embodied in Order M-43 is expected to be reviewed by the Tin Plate Industry Advisory Committee when it meets in Washington about Aug. 15. Extent of the export load directive for this period likely will have an important bearing on final decision. Prospective tin plate demand for the postwar years shows much promise, and, on basis of expansion programs now under way, future requirements should substantially exceed best volume in prewar years.

Steel Plates . . .

Production better, mills heavily loaded in light gages. Tank work gives much tonnage

Plate Prices, Page 145

Boston—Deliveries are in better volume as plate mills maintain high production, but the load is top-heavy in smaller gages. Mills are filled through this year except in rare instances, but are taking orders for next year, some for second quarter shipment. Delays in steel have extended some outdoor plate projects, standpipes on Cape Cod placed earlier this year; several water storage construction jobs are nearly three months behind schedule. Pittsburgh-Des Moines Steel Corp. is low on two stand pipes, at Seekonk and Westboro, Mass., approximately 275 tons. Passenger railroad car and trolley coach construction is also behind schedule. Cars placed with Worcester builder by the New Haven railroad have not reached the shop stage, while trolley coach deliveries extend well into next year because of delays in parts, notably motors and electrical equipment.

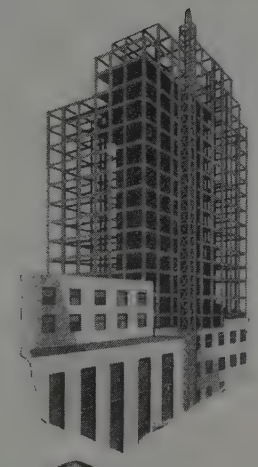
Birmingham—While plate mills are generally on a satisfactory tonnage basis and expect to make some inroads on backlogs within the next two to four months, there is nothing in the immediate plate situation to cause much optimism. Demand holds at a high level but somewhat off from the peak.

Seattle—Plates are in good demand and shops report many small jobs, mainly tanks and boilers. Fairview, Oreg., has awarded a 35,000-gallon steel water tank to Steel Tank & Pipe Co., at $5350. Seattle will open bids July 25 for replacements involving 720 feet of 78-inch steel pipe, estimated to cost $70,000.

Philadelphia—Most volume falling in first quarter is carryover tonnage, although some orders for next year are being booked, contrary to the general policy on other finished steel products. Inquiry for light plates, however, is difficult to place as most mills are overloaded. Producers are still placing a percentage limitation on volume of light tank plates accepted in any one order. Extended deliveries and shortages in castings is reflected in some additional switching to weldments, which affects heavy plates. Superstructures of two passenger liners to be built for the Maritime Commission will be ultra-stream lined and will be largely of aluminum, taking 770 tons.

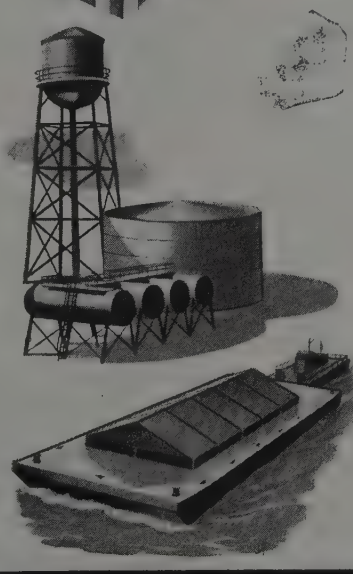
New York—Gas holders, one at Jam-





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THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Offices at BIRMINGHAM, New York, Pittsburgh, Washington and New Orleans. Fabricating plants at Birmingham and Pittsburgh. Shipyards at Pascagoula, Miss., and Decatur, Ala.

THE

NATIONAL CITY BANK

OF CLEVELAND

Statement of Condition

JUNE 29, 1946

ASSETS

Cash and Due from Banks	$103,780,155.83
United States Government Obligations	255,936,934.73
Other Securities	13,595,294.17
Loans and Discounts	96,150,327.97
Investment in Banking Premises	1,665,370.00
Customers' Liability on Acceptances and Letters of Credit	755,906.69
Accrued Interest	1,023,655.04
Other Assets	216,165.75
	$473,123,810.18

LIABILITIES

Capital Stock (625,000 shares)	$10,000,000.00	
Surplus	10,000,000.00	
Undivided Profits	2,785,882.15	$ 22,785,882.15
Reserves		3,160,893.46
Acceptances and Letters of Credit		755,906.69
Accrued Interest and Expenses		1,229,028.81
Deferred Credits and Other Liabilities		458,288.51
Corporation, Individual and Bank Deposits	$290,330,782.92	
Savings Deposits	58,501,354.37	
Trust and Public Deposits	35,337,224.10	
U. S. Government War Loan Account	60,564,449.17	444,733,810.56
		$473,123,810.18

Contingent Liability on unused loan commitments $14,182,239.74

NOTE: United States Government obligations carried at $100,220,606.93 are pledged to secure trust and public deposits, U. S. Government War Loan account, and for other purposes as required or permitted by law.

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

aica, N. Y., for the Brooklyn Union Gas Co., and another at Elizabethport, N. J., each with capacity for 10 million cubic feet, are the largest postwar inquiries in this category, taking substantial tonnages of plates Bartlett-Hayward division, Koppers Co., Baltimore, will fabricate the holder at Jamaica and bids are being taken on the second. Plate mill schedules are filled into first quarter on all grades in most instances and while some new orders are being taken for delivery next year the volume accepted for light-gage carbon tank steel is subject to limitations.

Structural Shapes . . .

With CPA approvals limited, demand for shapes shrinks with mill production back near normal rate

Structural Shape Prices, Page 145

Pittsburgh—Structural fabricators indicate more concern over the ratio of recent CPA approvals of construction projects. They contend that rapid headway should be made against order backlogs through the rest of this year now that steel production is back to normal. Contracts are expected to be placed soon for a new bus terminal in Pittsburgh recently approved by CPA and valued at $130,000. With mill deliveries so far extended, volume of new structural inquiries has declined in recent weeks, including highway and bridge construction which is not governed by CPA regulations. Much of this work already is far behind schedule due to lack of structural steel.

Chicago—New structural fabricating business has tapered sharply, following the pattern started over a month ago. This is due partly to lack of CPA approval on some projects and the general impression that steel will be in short supply for months. Awards of fabricated steel also are declining. Fabricating shops lack adequate steel to complete work in progress and are not active in seeking new business.

New York—Award of 2500 tons for a manufacturing plant, at White Oak, N. J., is the outstanding contract for fabricated structural steel, inquiry for which is substantial, although several thousand tons have thus far been held back by lack of authorizations. Deliveries on fabricated steel average six to seven months, except in smaller lots, which are numerous. Structural mill production continues ahead of expectations; time lost, however, by some mills averaged more than for most other products and the backlog is large, notably in small sizes.

Boston—More than balancing declines in general construction, structural steel bridge inquiry is up substantially, approximating 7500 tons, mainly for Maine and Connecticut; new projects for the latter state, 1450 tons, close July 22-29, most on the latter date, at Hartford. As most New England fabricating shops are not bridge equipped, they are affected by the decline in non-housing projects, although demand for small lots for industrial expansion holds up well. Authorizations for the week ending July 13 totalled 56, amounting to $1,641,342, in-

cluding a $350,000 graduate training and research building, cyclotron group, Harvard University. General Electric Co. will expand foundry facilities at Everett, Mass. and Northeast Airlines Inc., will spend $625,000 for a service hangar at East Boston. Deliveries on fabricated steel are more extended, well into first quarter on most larger tonnages, while small lots are also affected by the lack of stock sizes and ability to substitute. Plain material is also extended into next year, although structural mills are picking up production encouragingly.

Seattle—Fabricators are receiving less than half the tonnage required, allocations being far below needs. Shipments are arriving slowly and local inventories are unusually low, making it difficult to bid. Much tonnage is being absorbed in jobs under 100 tons and fabricators are engaged steadily. Pacific Car & Foundry Co. has booked 250 tons for the Zellerbach pulp mill at Camas, Wash., and 150 tons for boiler houses at Puget Sound navy yard and at the Tacoma smelter.

Philadelphia—Fabricating shops are booked through this year and into next, notably the larger units with heavy backlogs. In some cases these are not interested in quoting on complicated work, due to lack of drawing room help. Structural mills are again rolling in large volume but are heavily loaded with small sizes. Most are far behind on commitments but one unit in the East has reduced the lag to four weeks, while others still are two to four months behind. Restrictions on nonhousing projects will continue for at least 60 days. Since March 26 through July 4 CPA district offices approved 36,228 applications for nonhousing structures valued at slightly over $1.5 billion and turned down 19,453 valued at $833 million.

Reflecting the tight situation in steel angles, only one firm quoted on an inquiry for 1000 tons for federal prison industries at Lewisburg, Pa. This was the Sweet's Steel Co., Williamsport, Pa., and that mill quoted on an amount not to exceed 50,000 pounds at 2.949c.

Reinforcing Bars . . .

Production is held down and many projects are deferred from lack of available tonnage

Reinforcing Bar Prices, Page 145

Pittsburgh—Volume of new inquiries in recent months has declined, reflecting the fact deliveries are so far extended and due to some extent to CPA control. Sales to producers east of the Rockies totaled only 49,000 tons in May and June sales are estimated at 55,000 tons. This compares with 150,000 and 123,000 tons in October and November, respectively, last year. However, large tonnage inquiries for flood walls for river improvement projects and similar work are currently active. Over 2000 tons for two sections of the Penn-Lincoln highway program here are seeking placement. Rerollers have been more successful in getting rails recently, and their operations are edging upward. Despite the fact export inquiries for reinforcing bars continue heavy, chiefly from South



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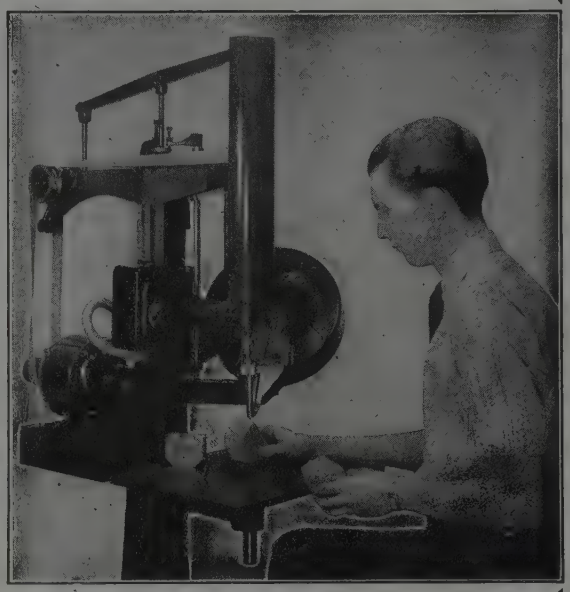
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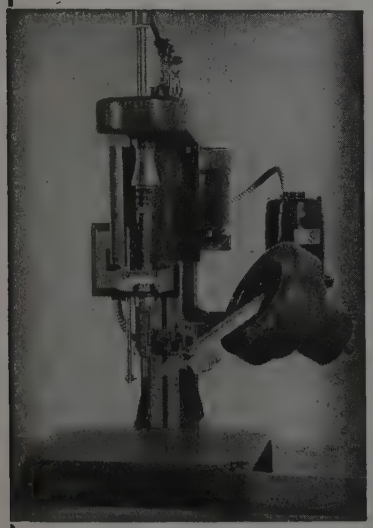
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America, producers are shipping less than 5 per cent of total output for export.

New York—Although close to 15,000 tons are wanted in this area, mainly for bridges and highways, lack of steel and dim prospects for increased tonnage in the near future, result in dearth of quotations, on larger tonnages especially. Nearly 7000 tons are required for tunnel approach contracts. Production of concrete reinforcing bars during first half was under 400,000 tons of new billet. At least 100,000 tons are required for Bureau of Reclamation projects in the West on which bids are few; some contracts have been awarded subject to steel procurement in mill lengths, the bureau to fabricate.

Chicago—Reinforcing steel producers display little interest in new business. Inquiries are numerous, although involving small quantities, but most suppliers are oversold and do not seek business. Awards are light, a reflection of the smaller volume of inquiries in recent weeks.

Cleveland—Specifications for projected highway construction call for wider use of steel than during the war, a fabricator reports. However, only a small portion of the highway work has come out, said this fabricator, who believes projects are held back by high wage rates and scarcity of materials and an inclination of public officials to save highway work until needed to bolster employment. Deferred mill deliveries of steel continue to plague fabricators.

Seattle—Mills have a nine months backlog and are unable to accept a large part of inquiry. Labor inefficiency is a handicap but plants are operating at as high rate as conditions will permit. Public works call for large tonnages but some state and industrial projects are being delayed by lack of material. Chelan county, Washington, has called bids for July 29 for a 130-foot reinforced concrete bridge over Icicle river.

Denver—By far the heaviest buyer of reinforcing bars this year has been the Reclamation Bureau, with headquarters here. Because of low production, due in part to lack of semifinished and to low-profit margins, many inquiries, involving hundreds of tons, bring out no bids. This situation has prevailed for more than three months. Inquiries thus far in July are for more than 7500 tons of billet steel bars. Bureau contracts for heavy engineering equipment are numerous and involve large tonnages of steel and castings, to the value of several million dollars this month.

Tubular Goods . . .

Tubular Goods Prices, Page 145

Boston — Demand for smaller and medium sizes of tubing is strong, a larger ratio than normally going seamless and electric welded in place of lighter walled butt-weld. Merchant steel pipe inventories with producers are small and somewhat out of balance as to sizes; small butt-weld is probably tightest. Pipe mills in some cases have resumed operations at a better rate than anticipated, but are making up ground against quotas slowly, due to lost production earlier. Pipe mill stocks were badly depleted during the last suspension; in at least one instance shipments are only

now being resumed. Cast iron soil pipe has advanced $5 a ton to $85 and cast pipe prices are also higher, although increased before the passing of OPA.

Seattle—Cast iron pipe demand continues heavy but deliveries are difficult and uncertain. New labor differences again threaten water transportation, by which most cast pipe deliveries are made in this area. Months will be required to close present backlogs. Largest pending contract is for Kelso, Wash., where bids have been opened on 1000 tons of various sizes.

Pig Iron . . .

Certified orders crowding back shipments to other consumers for third and fourth quarters, already short

Pig Iron Prices, Page 147

New York—Certified orders for pig iron for August and September delivery, are large enough to seriously affect heavy foundries and large melters not included as producers of castings entering into products required for housing. Pipe foundries will get large tonnages; one asked certification of better than 13,000 tons for one month. With the coke and fuel supply critical, blast furnaces will meet certified tonnage demand with difficulty and at the expense of others. Not only will third quarter deliveries be affected, but fourth quarter schedules also. Blast furnaces are making slight progress in catching up with demand and melt continues restricted. Demand for certified tonnage is especially heavy in the South.

Boston—Pig iron deliveries are slightly heavier as blast furnace production in the Buffalo area rises, but demand is so widespread, most consumers being short, that tonnage continues to be spread thinly, with melt restricted. All grades are tight and furnaces are frequently revising production to meet emergencies. Certifications are appearing in sufficient volume to force general revisions in delivery schedules during next two months and some foundries producing castings not required in the housing program stand to get less iron; in this category are some of the largest melters, including textile mill equipment shops. Less southern iron is coming into New England, but all-rail tonnage from that territory has been heavier than generally realized during the first half, slightly better than 700 tons a month.

Cincinnati—Pig iron shipments show little improvement. As a result, foundries are operating on a hand-to-mouth basis and melt is curtailed. The price situation on southern iron remains confused, but melters are interested primarily in deliveries rather than price. The certification program will help some district interests while other foundries are certain to be hard hit unless the tonnage coming into the district is greatly increased.

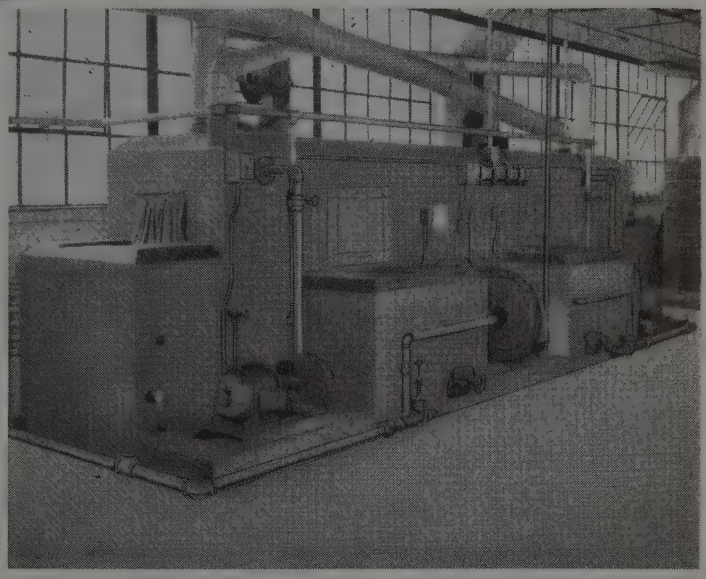
Birmingham—Pig iron melters predict real hardship for many smaller foundries and miscellaneous users as a result of CPA certification. Thus the already critical shortage likely will be materially aggravated. Pipe plants continue to be caught short and smaller

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foundries are hard pressed to maintain even an irregular schedule.

Pittsburgh—No relief from the critical pig iron shortage is indicated for the next 60 days at least. Plans for bringing high cost units now idle under a subsidy arrangement have been temporarily dropped with the expiration of OPA, and until such a program can be worked out through a revised OPA measure carrying a provision for subsidy payments or some other procedure, possibly through RFC, there is little prospect of these units being returned to service.

Nearly all foundries have less than one week's supply of pig iron, and coke stocks are not in much better shape. When the CPA housing and farm implement directive program become operative during August and September, many of these foundries not coming within the scope of these directives will have to curtail production for this certified tonnage alone will approximate 50 per cent of the merchant producer's output here.

Chicago—Foundries and pig iron distributors at the moment are pretty much up in the air over Direction 13 to steel preference order M-21, which gives priority to castings for the housing program and farm machinery products. Trouble is that the order arrived late in hands of all interested parties and too close to the deadline for filing certifications. Another week may see some alleviation of the tension. Iron demand still far exceeds supply, a situation which appears to have no remedy in the immediate future. As yet, there have been no price advances announced on pig iron, not even southern iron on which prices have been raised $3 and $4, Birmingham base.

Philadelphia—Pig iron supply with several steelworks is more critical than scrap. One Pennsylvania consumer has taken in no iron for a month. One furnace normally supplying this area is expected to resume blast next month. All foundries are clamoring for iron, which is not available currently and slightly heavier production is being spread thin and not in sufficient volume to satisfy any one customer. Adding to complications are certified tonnage orders for August and September. This volume would not ordinarily be burdensome but even minor disruption of production and delivery schedules at this time is serious when practically all consumers are short, not ably for heavy founders and others not producing for products under Direction 12. One steelworks furnace is shipping slightly more iron to the merchant trade but demand for hot metal limits this volume.

Buffalo—Large tonnages of merchant iron for future delivery have been placed on sellers' books despite uncertainty over prices. Orders are based on price at time of shipment. Sellers report prices will be negotiated if no government control level is fixed. Foundry demands continue to exceed available supplies. More melters report efforts to increase production are stymied by limited receipts of iron.



Scrap . . .

Steel scrap prices hold firmly at former OPA ceilings but cast sells much above that level

Scrap Prices, Page 148

New York — Cast scrap is selling as high as $5 a ton over former ceiling, but steel mills are holding on heavy melting grades, pending clarification of OPA status. Supply of steel scrap is short and some tonnage is being withheld. Railroad policy differs; some are selling and others are not. If the market becomes definitely free, new clauses specify prices prevailing at time of shipment. Pennsylvania railroad is offering 9595 tons last week, requested that to eliminate any possibility of misunderstanding, prices be quoted in figures and not simply by stating ceiling prices. Some time will elapse before tonnage will be forthcoming from ship dismantling and other government agencies; preparation of scrap from most sources under the new plan will be more costly and difficult, also.

Boston—Breaks through ceilings are confined to scattered transactions in cast grades and in some instances the initiative has been with buyers badly in need of foundry scrap. Steelmaking grade prices are unchanged, and, although some tonnage is being held back on the chance of an advance, shipments are fair in view of the limited supply from industrial plants, yards and railroads. Volume of unprepared reaching yards is not sufficient to maintain processing equipment and operators bid over ceilings for unprepared to get tonnage. Upgrading

is centered mostly in low phos, the $2.50 premium for that grade being billed for regular No. 1 steel. The supply of low phos has been worked down substantially by heavy shipments.

Cincinnati—Little iron and steel scrap tonnage is coming out, while demand in some quarters is approaching the desperate stage. Some dealers are holding material in hope of a price increase and others are moving tonnage promptly. The OPA ceilings are holding for most of the market, an influence being mills' refusal to aid in creating a bulge in prices. Deflections in the prices may develop first in cast which is needed badly by foundries unable to obtain adequate supplies of pig iron and whose scrap stocks are depleted.

Cleveland—Faced with the probability they will have to pay increased prices for scrap, a group of scrap consumers met here recently to discuss the outlook. Although results of the meeting were not announced publicly, it is reported the consumers said they would refuse to buy scrap at increased prices. However, to keep steel production at high levels consumers have been operating on a hand-to-mouth basis and also dipping into reserves. Aim of the consumers' declaration of refusal to buy scrap at higher prices, said one dealer, is to discourage hoarding of scrap and to hold down as much as possible a price rise.

Seattle—Steel mills continue to receive sufficient supply of melting steel scrap but some shortage is expected to be encountered as shipyard sources have been depleted and will not last much longer. Surplus stocks are still reported moving from the Portland area, 2700 tons of rails and plates being shipped to South America and 3000 tons of shapes to be sent later.

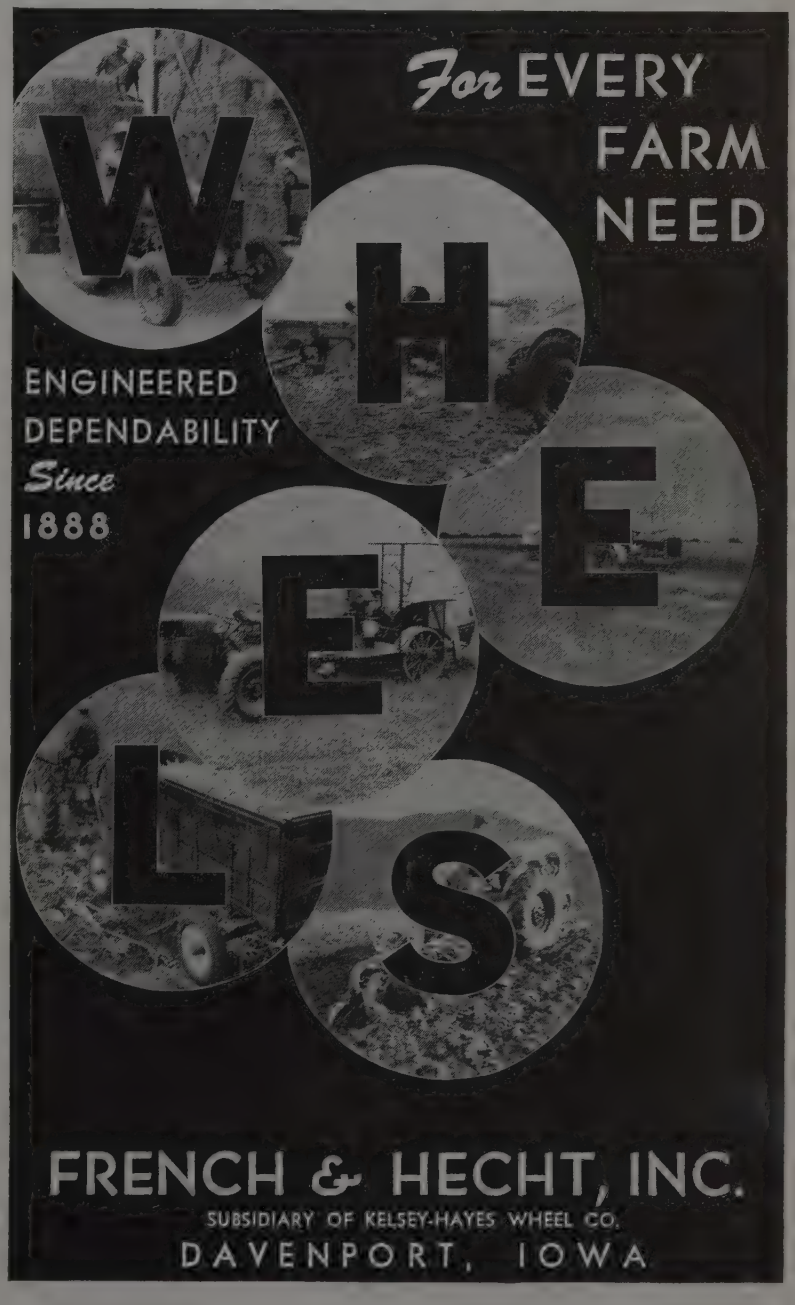
Birmingham—Scrap reserves at mills and foundries are dwindling as scarcity continues. Some tonnage is being held awaiting final OPA disposition. OPA ceilings are being offered but there are no takers.

Chicago—Continued uncertainty over the future of OPA is affecting the flow of scrap here in a major way. Consumers are unwilling to pay more than former ceiling prices and not much tonnage is attracted. Shipments on old orders proceed and this not enough for mills to sustain their present high level operations. The makeup comes from inventory, which has shrunk to dangerous levels. There is no evidence that over-ceiling transactions have been made, consumers and sellers preferring to remain on the safe side by holding the line during this interim period. It is the feeling that considerable material is being held from market for possible higher prices in a free market.

Philadelphia—Although steelworks are losing inventory, consuming scrap faster than incoming volume, prices on steelmaking grades are held at former ceilings. On the other hand, cast scrap has broken through the ceiling, advancing $5 per ton in some trading. Although badly in need of cast, one consumer refused to pay $33.50, delivered. Shortages in pig iron are draining off low scrap supply at steel mills. To maintain ingot rates most have increased the ratio of scrap in the melt and at least two are operating practically entirely on scrap. Foundries are as badly pinched, as indicated by payment of higher prices to obtain material. While a few are down entirely for lack of scrap or iron, melts are on restricted level. While a limited tonnage may be held back awaiting price clarification, the real shortage in steelmaking and other grades prevails regardless.

The price of cast scrap has openly advanced to $28.50, delivered, or $28 with a 50-cent commission. Volume is substantially more active at the higher price, the heaviest in many weeks. This increase supersedes scattered sales at the former ceiling in maller transactions and larger brokers now are participating.

Buffalo—Higher prices on all scrap items are expected shortly as cast grades were reported changing hands at $5 a ton above the old OPA ceilings. Canadian interests were among buyers in the local market. Further inquiries from across the border are expected as a result of the Dominion dollar being placed on par with the U. S. dollar. No sales of steelmaking scrap were reported above the OPA ceilings, but the feeling prevails that increases are in the offing regardless of whether the OPA is revived. At present dealers are shipping steel items against old orders, but are refusing new business, or accepting only negligible tonnage. Meanwhile, the supply problem for mills becomes more desperate. Stockpiles are shrinking and rumblings continue that ingot operations will be curtailed unless receipts improve. Another 5000-ton boatload is due from the Duluth area.



Warehouse . . .

Some lessening in demand follows better shipments from mills but warehouse stocks still are short

Warehouse Prices, Page 146

Chicago—Good demand still is confronting warehouses larger than they can accommodate with scant and unbalanced inventories. However, volume has declined somewhat, a reflection of the fact that with mills back to normal rate of production, industries are getting more adequate supplies direct. Chicago warehouse prices are unchanged by the recent increase in freight rates, but higher prices are being made effective in outlying cities in the Middle West. Distributors expect to have stocks improved, providing operations can be maintained at the present level.

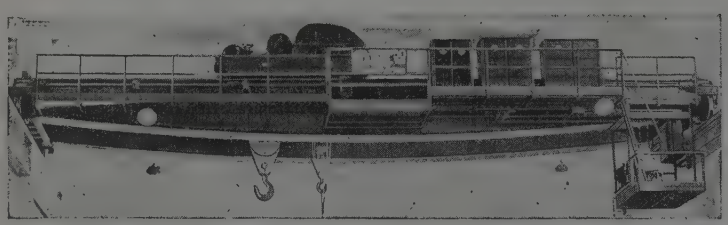
Boston—What lag in sales warehouses have experienced since first of the year is due entirely to lack of inventory; demand has been and is heavy, but inventory loss has been steady for some months. Stocks of most wanted products are low, including shapes, small plates, all grades of sheets in light gages, wire products and small carbon bars. Slower moving goods, alloys, large carbon bars, larger mechanical tubing and stainless bars, are ample with most distributors. First month of this quarter will pass without material improvement in mill deliveries under direction 12, but programs for delivery by some producers would indicate an improvement during the last half of this period.

Cleveland—Acute shortage of steel has brought to this district several potential buyers from other areas, who are combing warehouses for steel. Some are from the West Coast, and last week one was here from Texas. Some of the inquiries come from large consumers who normally would buy direct from mills but who now are searching every avenue of possible supply. Particularly low in stock or absent entirely are sheets, structurals and plates. Some distributors have thought mill shipments might improve but thus far this has not materialized. Prices are unchanged.

Cincinnati—Mill shipments to warehouses, especially in scarce items, are slow to expand and consequently stocks remain seriously out of balance. Demand shows no evidence of slackening against a dearth in supplies of sheets, structurals and plates.

Philadelphia—There is slight improvement in deliveries to distributors but tonnage receipts of products most in demand have been disappointing thus far in this quarter. For some months a heavier volume has moved from warehouse than has been taken in, although lack of stock and unbalanced inventories have retarded sales. Demand in lighter size ranges in common carbon products is in excess of ability of most to supply. Cold-finished bar inventories are fairly well balanced, as are alloys. Buying of the latter is relatively below that for carbon steel.

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Rails, Cars . . .

Track Material Prices, Page 145

New York—Freight car deliveries were off 722 units last month 2094, compared with 2816 in May; lack of materials and components is slowing up assembly of both freight and passenger cars Second quarter deliveries, and thus far third, are well below capacity of the industry. Delays in securing components, notably for passenger cars, will continue for some weeks due to production lost by suppliers in strikes earlier this year. Domestic car orders were slightly higher in June, 3064, compared with 3025 in May. In the first half-year, deliveries totaled 15,162 with 33,150 on order July 1. Comparisons follows:

	1946	1945	1944	1943
Jan.	420	7,200	1,020	8,365
Feb.	1,795	1,750	18,240	350
March	300	2,500	6,510	1,935
April	3,405	1,120	4,519	1,000
May	3,025	1,526	1,952	870
June	3,064	670	1,150	50
July	.....	3,500	795	4,190
Aug.	.....	7,240	3,900	8,747
Sept.	.....	12,840	400	6,820
Oct.	.....	1,320	2,425	5,258
Nov.	.....	1,650	1,065	870
Dec.	.....	4,116	16,245	2,919
Total	.....	45,432	53,221	41,355

Wire . . .

Wire Prices, Page 145

Boston — Production is heavier with eastern plants of American Steel & Wire Co., Worcester, New Haven and Trenton again operating after being down for two weeks. Loss of substantial rod tonnage and necessity of building up raw steel supply, however, still cramps finishing departments. Deliveries have been extended and a substantial tonnage booked on which delivery was expected this year will not be shipped by most mills and carryovers will be large on numerous items, notably high-carbon specialties. Supply of rods has never been more critical with most wire drawers. Electrical cable and other wire products taking copper are hampered by shortages in that metal.

Birmingham — Jobbers and dealers have virtually no wire stocks, nails, especially, are one of the scarcest commodities but is little if any worse than merchant wire and fencing. Some quarters believe eight months to a year will be required to show any material improvement.

Chicago—It is stated that enough hard carbon wire is now being produced to meet current requirements for automobile and truck cushion springs. However, any considerable production lift would find supplies inadequate. Wiremakers are finding that jobbers and dealers in merchant products are becoming more discriminating and are limiting purchases to standard grades and named products.

New York—Pressure by the automobile industry indicates improvement in cushion spring wire supply, but somewhat at the expense of bedding and furniture industry. Limited rod supply, heavy backlogs in high-carbon specialties and other long process items and lost production by eastern mills thus far this quarter, indicates wire producers will be months getting from under the current load. There is unbalance in backlogs,

which are light on marginal products which are not being produced in volume, common basic wire among others. Wire fabricators normally depending on these marginal items are in a bad way for stock. An increase in price in these wires appears to be needed for higher production.

Equipment Buying Fairly Active In Pacific Northwest District

Seattle—Considerable machinery and heavy equipment orders are reported being placed in this district.

Major projects in the area are public works, the Bureau of Reclamation placing many contracts for units of the Columbia Basin improvement in eastern Washington state and increasing facilities at Grand Coulee dam.

The bureau has placed a $310,052 award with the Joshua Hendy Iron Works, San Francisco, for 1188 trash racks at the Coulee power plant. Allis-Chalmers Mfg. Co. has received a contract at $115,350 for furnishing seven 115-kv oil circuit breakers.

Newport News Shipbuilding & Drydock Co., Newport News, Va., was low to Denver for three turbines for Coulee, $762,300 for one and $2,213,000 for three. Woodward Governor Co., Rockford, Ill., was low at $40,400 each for governors.

An award went to Goslin-Birmingham Co., Birmingham, Ala., at $120,041 for regulating gates Anderson Ranch dam., Idaho.

S. Birch & Sons, Great Falls, Mont., is low, $401,378, for water and other facilities Hungry Horse project, Montana.

Bids are called at Denver Aug. 19, on Spec. 1428, for a 300 kva indoor unit substation at Odair, Wash.

Bonneville has awarded a contract to General Electric Co. at $26,026 for transformers at Ellensburg station and called bids July 19 for construction of buildings at Mead station included a repair and machine shop, and a 20-car storage garage. Aug. 9 bids will be received for construction of the Arlington, Wash., substation control house.

New Dictionary Explains Terms Used in Insurance

A dictionary of insurance terms has been issued by the Employers Mutual Liability Insurance Co. of Wisconsin and the Employers Mutual Fire Insurance Co., Wausau, Wis., designed to make clear the meaning of terms used in the insurance policies owned by practically everyone.

The book contains over 225 definitions of words commonly found in fire, property and liability insurance policies.





STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2600 tons, nylon plant at Chattanooga, Tenn., for E. I. du Pont de Nemours & Co., Wilmington, Del., to Ingalls Iron Works Co., Birmingham, Ala.

2500 tons, manufacturing plant, L. A. Dreyfus Co., White Oak, N. J., to Harris Structural Steel Co., New York.

800 tons, power plant, Pacific Gas & Electric Co., Bakersfield, Calif., to American Bridge Co., Pittsburgh; Stone & Webster Engineering Corp., Boston, engineer-contractor.

300 tons, Erie railroad bridge, two-span through girder rt. 4, sec. 5A, Warren Point, East Paterson-Fairlawn, N. J., to Phoenix Bridge Co., Phoenixville, Pa.; Elldorer Construction Co., New York, general contractor.

250 tons, pulp mill construction Zellerbach Paper Corp., Camas, Wash., to Pacific Car & Foundry Co., Seattle.

280 tons, manufacturing building for Johns Manville Co., at Tilton, N. H., to Bethlehem Steel Co., through H. A. Kuljian & Co., Philadelphia, engineer-contractor.

210 tons, three-span steel stringer bridge, Great Barrington-Sheffield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

165 tons, five-span W. F. I-beam bridge, Newport, Vt., to Vermont Structural Steel Co., Burlington, Vt.

150 tons, boiler houses Puget Sound Navy yard and smelter, Tacoma, to Pacific Car & Foundry Co., Seattle.

125 tons, garage, United Electric railroad, Providence, R. I., to Phoenix Bridge Co., Phoenixville, Pa.

Unstated, 1188 trash racks, Grand Coulee power plant, to Joshua Hendy Iron Works, San Francisco.

Unstated tonnage, additional plant building. Monowatt Corp., Providence, R. I., to Providence Steel & Iron Co.; Rowley Construction Co., Pawtucket, R. I., general contractor.

STRUCTURAL STEEL PENDING

835 tons, furnishing structural steel, grade separation, carrying Wilbur Cross parkway over New Haven railroad and Connelly avenue, Hamden, Conn.; bids July 29, Hartford,

400 tons, boiler house for Schlitz Brewing Co., Milwaukee, H. A. Kujian & Co., Philadelphia, engineer-contractor.

400 tons, building, Military Academy, West Point, N. Y.; bids in.

300 tons, two bridges for Reading railroad near Shamokin, Pa.

190 tons, Weston's bridge, Saco river, Fryeburg, Me.; bids July 24 to state highway commission, Augusta, Me.

175 tons, furnishing structural steel, grade separation carrying Wilbur Cross parkway over Dixwell avenue, Hamden, Conn.; bids July 29, Hartford.

160 tons, 93-foot skew span plate girder bridge, Wilbur Cross parkway, Vernon, Conn.; Arigoni Construction Co., New Britian, Conn., low.

150 tons, plant building for Standard Pressed Steel Co., Jenkintown, Pa.

135 tons, 150-foot skew span bridge, route U. S. 5, Wilbur Cross parkway, Meriden, Conn.; bids July 29, Hartford.

120 tons, state highway bridge in Cambria county, Pa.

115 tons, two-span beam bridge, Wilbur Cross parkway, North Haven, Conn.; bids July 22, Hartford.

Unstated, machine shop at Coulee project: bids to Reclamation Bureau, Denver, Aug. 13.

Unstated tonnage, structural steel for steel warehouse, Grand Coulee dam, Bureau of Reclamation, Denver; American Bridge Co., Denver, low $76,738, Kaiser Co. Richmond, Calif., second $98,917, on spec. 1341.

REINFORCING BARS . . .

REINFORCING BARS PLACED

100 tons, plant addition, Western Electric Co., Inc., West Haven, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Dwight Building Corp., New Haven, general contractor; structural steel divided, Topper & Griggs, Hartford, and Connecticut Steel Co., New Haven.

REINFORCING BARS PENDING

1,136 tons and 5000 pieces for Anderson Ranch dam, Idaho, bids to Reclamation Bureau, Denver, July 18.

1000 tons, power plant, Sault Ste. Marie, Mich., for U. S. Engineer; bids Aug. 14.

850 tons, tunnel, Champaign, Ill., for University of Illinois; bids July 15; none received, new to be asked.

600 tons, water filtration plant, Hammond, Ind., for city; bids July 26.

275 tons, new store, Chicago, for Baskin Clothing Co.; Henry Ericsson Co., Chicago, contractor; bids July 5.

165 tons, elevated highway section, Barclay to Cedar streets, New York; bids July 22.

Unstated, water softening plant, job No. 2, Sidney, O., for city; bids July 15.

Unstated, pumping station and reservoir, for Saginaw-Midland, Mich., water supply, contracts E and F; bids Aug. 10.

Unstated, killing and cooler building, Evansville, Ind., for Swift & Co.; bids July 31.

Unstated, addition to Columbia airport and hangar, Portland, Oreg.; E. E. Settergren, general contractor.

Unstated, 130-foot girder bridge, Icicle river, Chelan county, Wash.; bids to Donald West, county engineer, July 29.

Unstated, machine shop and garage, Mead, Wash.; bids to Columbia Power Administration, Portland, Oreg. July 19.

PLATES . . .

PLATES PLACED

130 tons, standpipe, Seekonk, Mass., to Pittsburgh-Des Moines Steel Corp., Pittsburgh.

115 tons standpipe, Westboro, Mass., to Pittsburgh-Des Moines Steel Corp., Pittsburgh.

Unstated, steel water tank for Fairview, Oreg., to Steel Tank & Pipe Co., Portland, Oreg., low $5,350.

PLATES PENDING

100 tons, caisson rings, No. 2 toll office building, Chicago, for Illinois Bell Telephone Co.; George A. Fuller Co., Chicago, contractor; bids July 16.

Unstated, one or two all-welded steel twin-screw shallow-draft diesel-powered tunnel boats for Union Barge Line Corp., Pittsburgh; bids July 31.

Unstated, replacements 78-inch main water supply pipe, Seattle; bids July 25.

PIPE . . .

CAST IRON PIPE PENDING

1,000 tons, various sizes, Kelso, Wash.; bids in.

RAILS, CARS . . .

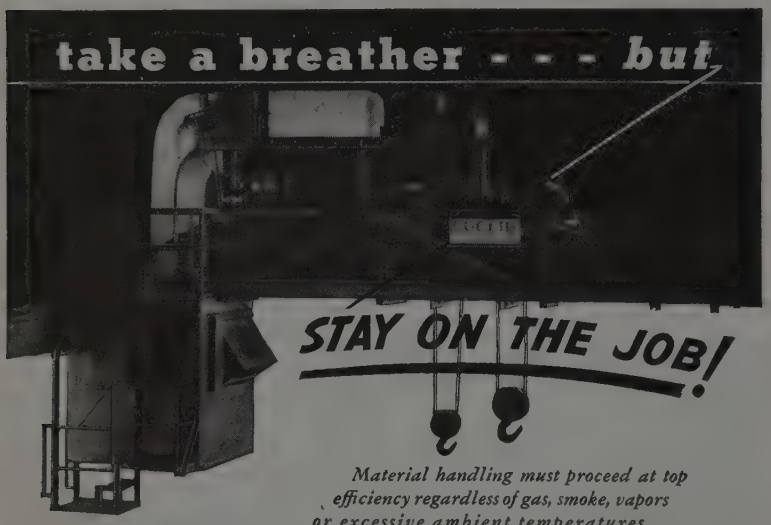
RAILROAD CARS PLACED

Union Pacific, 500 box to Pullman-Standard Car Mfg. Co., Chicago and 500 box to General American Transportation Corp., Chicago; also 500 forty-foot automobile cars to American Car & Foundry Co., New York.

Union Tank Lines, 500 fifty-ton tank cars for transportation of liquefied petroleum gas, to American Car & Foundry Co., New York, and 100 to general American Transportation Corp., Chicago.

RAILROAD CARS PENDING

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SEAMLESS STEEL PIPES
STAINLESS STEEL PIPES

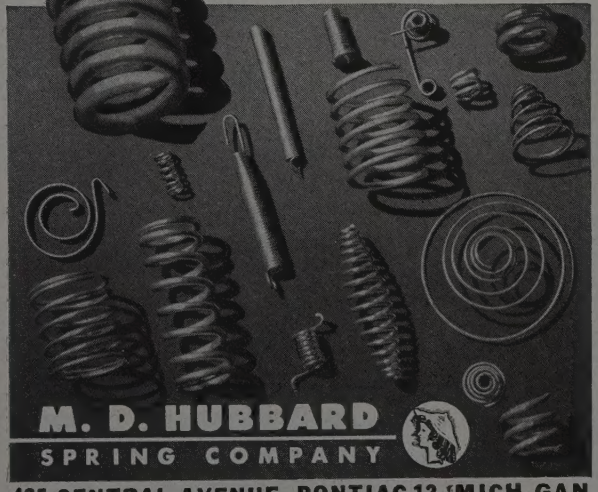
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LOCOMOTIVES PLACED

American Rolling Mill Co., one 660-horsepower diesel-electric switcher, to Baldwin Locomotive Works, Philadelphia.

Consejo Adm. de Los Ferro Carril Nationales, Colombia, six freight, 4-8-2 type, to Baldwin Locomotive Works, Philadelphia.

Crows Nest Pass Coal Co., Canada, one 660-horsepower switcher to Baldwin Locomotive Works, Philadelphia.

Missouri - Kansas - Texas, six 1000-horsepower switchers, to Baldwin Locomotive Works, Philadelphia.

National Railways of Mexico, 10 steam locomotives, 2-8-0 type, to Baldwin Locomotive Works, Philadelphia.

CONSTRUCTION AND ENTERPRISE

ALABAMA

ANNISTON, ALA.—Anniston Foundry Co. plans an addition to its foundry plant estimated to cost about $110,000.

CALIFORNIA

ALHAMBRA, CALIF.—William Meeker has building permit for a machine shop at 328 South Palm Ave., to cost about $10,000.

BERKELEY, CALIF.—Pacific Coast Paint & Varnish Co., Cedar and Fourth Sts., plans a three-story plant 60 x 100 feet, estimated to cost about $120,000. Ellison & King, 500 Sansome St., San Francisco, are engineers.

GLENDALE, CALIF.—Columbia Trailer Co., 4300 San Fernando Rd., has building permit for plant addition to cost about $14,500.

OAKLAND, CALIF. — Advance Pump Co., 3454 Harlan St., has let contract to Christensen & Lyons, Oakland, for a plant building 80 x 260 feet, estimated to cost about $100,000.

LOS ANGELES—Allen Co., 394 Dupree Rd., Pico district, has building permit for a welding and machine shop containing 1140 square feet, to cost about $6000.

LOS ANGELES—Benner Mfg. Co., 537-A West Lexington Ave., has permit for erection of a machine shop 50 x 125 feet, to cost $25,000, at 4528 Cutter St.

LOS ANGELES—California Well Tool & Machinery Works, 1033 Alhambra Ave., is building a boiler house 18 x 35 feet.

SACRAMENTO, CALIF.—Pacific Can Co., 290 Division St., San Francisco, plans a can manufacturing plant to cost about $100,000.

COLORADO

TRINIDAD, COLO.—W. J. Cannon & Associates, 1180 Sherman Ave., Denver, plan enlargement of natural gasoline absorption plant for manufacture of liquid petroleum gases, to cost about $750,000.

CONNECTICUT

HARTFORD, CONN.—Jacobs Mfg. Co., 2074 Park St., plans a plant addition to cost about $600,000. Albert Kahn Associated Architects & Engineers Inc., 345 New Center Bldg., Detroit, is engineer.

WATERTOWN, CONN. — Central Engineering Corp., Main St., is taking bids for a factory building estimated to cost about $90,000. G. Cornet, 126 Mewbury St., Boston, is architect.

GEORGIA

SAVANNAH, GA.—Union Bag & Paper Corp., Alexander Calder, president, will erect plant for manufacture of corrugated shipping containers on Butler Ave., to cost about $3 million, covering 160,000 square feet.

ILLINOIS

AURORA, ILL.—Barber-Greene Co., 631 West Park Ave., has let contract to Campbell-Lowrie-Lautermilch, 400 West Madison St., Chicago, for a one-story 80 x 625-foot plant addition.

WILSONVILLE, ILL—City is having plans prepared for a water supply system to cost about $125.000. Warren & Van Praag Inc., Standard Bldg., Decatur, Ill., are consulting engineers.

INDIANA

INDIANAPOLIS—Monarch Steel Co. Inc., 545 West McCarty St., has been incorporated with 100,000 shares of common stock at $1 per share and 5000 shares preferred at $100 each, to fabricate steel products, by F. T. Holliday and associates.

MISHAWAKA, IND.—Charles D. Hoyt Co. Inc., 1118 Forest Ave., has been incorporated with 3000 shares no par value, to manufacture screw machine products and other metalwork, by Charles E. Hoyt Jr. and associates.

MUNCIE, IND.—Warner Gear Co., East Seymour St., is having plans prepared for a one-story plant addition to cost about $350,000.

SOUTH BEND, IND.—South Bend Tool & Die Co., 1916 South Main St., has been incorporated with 5000 shares of $100 value, to manufacture tools and dies, by Robert Schleman and Carl Weidler.

VEEDERSBURG, IND. — Fountain Foundry Corp. has certified increase of capital stock to 2500 shares of $100 value.

MARYLAND

BALTIMORE — Consolidated Gas, Electric Light and Power Co. of Baltimore, Lexington Bldg., will build additional facilities, including turbine and boilerhouse additions, etc., at Turners Falls, buildings to cost about $2,500,000 and equipment about $4,500,000.

MICHIGAN

DETROIT—Fulgrip Collet & Tool Co., 15310 Cheyenne St., has been incorporated with $50.000 capital to manufacture tools, collets and drills, by Henry D. Fowlie, same addres.

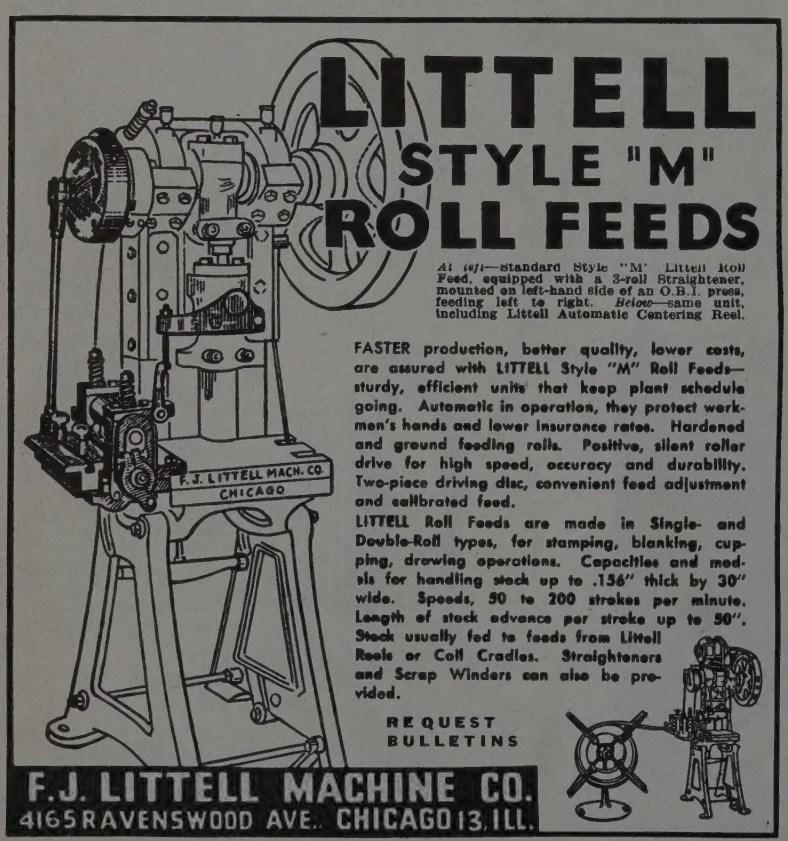
DETROIT — Horsman-Markin Corp., 2161 Penobscot Bldg., has been incorporated with $50.000 capital to manufacture gas burners, by Vernon H. Beckett, same address.

DETROIT—Kraft-Snyder Mfg. Co., 147 Jos. Campau Ave., has been incorporated with $50,000 capital to manufacture machinery and tools, by Fred C. Kraft, 719 Berkshire Ave., Grosse Pointe Park, Mich.

DETROIT—Petch Industries Inc., 3214 Book Tower, has been incorporated with $50,000 capital to manufacture metal products, by Charles L. Petch, 2773 Harper Ave., Mount Clemens, Mich.

DETROIT—Universal Swiss Precision Parts Co., 1745 Cavalry St., has been incorporated with $25,000 capital to manufacture precision parts for mechanical devices, by Hyman M. Beale, 4345 Buena Vista Ave.

DETROIT—Anderson Brass Co., 6530 West Jefferson Ave., has been incorporated with $100,000 to manufacture brass fittings and



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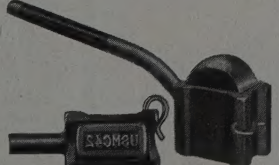
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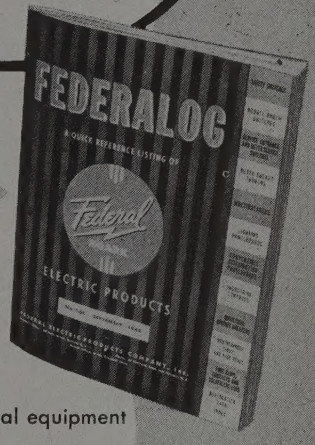
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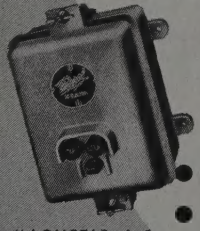
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DETROIT—William Mill & Co. Inc., 3287 Meldrum St., has been incorporated with $50,000 capital to manufacture tools, dies and fixtures, by William Mill, 676 Stimson St.

DETROIT—Detroit Plastic Engineering Co., 7047 East Eight-Mile Rd., Base Line, has been incorporated with $100.000 capital to manufacture dies, jigs, molds and fixtures. by Erik E. Eriksson, 14973 Flanders Ave., Detroit.

DETROIT—Die Engraving Co., 2492 East Grand Blvd., has been incorporated with $50,000 capital to manufacture drop forge dies. by Gustav E. Nyquist, 13320 Wilshire Blvd.

DEARBORN, MICH.—Venus Die Engineering Co., 3900 Wyoming Ave., has been incorporated with $25,000 capital to manufacture tools, dies, jigs and machinery, by William F. Thomas III, 525 Crestwood Ave., Birmingham, Mich.

FLINT, MICH.—C & K Machine Co., 2493 North Genesee Rd., has been incorporated with $20,000 capital to manufacture tools, dies, machines and fixtures, by Edward A. Conklin, 2501 North Genesee Rd.

PORT HURON, MICH.—Knox Industries Inc., 609 Peoples Bank Bldg., has been incorporated with $60,000 capital to manufacture tools, jigs, dies and machine products, by Harley R. Green, 1809 Tenth Ave.

NEBRASKA

COLUMBUS, NEBR.—City has voted $275,000 bonds for a water treatment plant, for which D. Price, Columbus, is consulting engineer.

NEW YORK

BUFFALO—Niagara Machine & Tool Works, 683 Northland Ave., will build a one-story 92 x 254-foot plant to cost over $100,000, with equipment to cost about $400,000.

OHIO

CLEVELAND—Clark Castings Corp. has been incorporated to manufacture metal castings, molds and machine parts, by Ezra Shapiro, attorney, Guardian Bldg.

CLEVELAND—Superior Die Casting Co., 17325 Euclid Ave., will build a new plant costing $215,000, to which operations will be removed.

COLUMBUS, O.—American Blower Corp., 606 Marion Rd., plans a one-story plant addition 240 x 250 feet, estimated to cost $300,000.

JACKSON, O.—Furnace Foundry Co. plans erection of a plant to cost about $200,000.

NILES, O.—National Bearing Division of American Brake Shoe Co., E. A. Williams, works manager, 4930 Manchester Ave., St. Louis, plans a one and two-story 180 x 230-foot foundry and 60 x 60-foot office building. J. Gordon Trumbull Inc., 8120 Olive St., St. Louis, is engineer.

NORWALK, O.—Chamber of Commerce, S. E. Bowen, secretary, announces a manufacturer of metal container plans to build a plant costing $120,000 on North Pleasant St.

WELLSVILLE,O.—City, C. F. Gluth, safety service director, plans a sewage disposal plant estimated to cost about $250,000.

YOUNGSTOWN—American Metal Beams Inc. has been incorporated by Raymond L. Falls, attorney, Realty Bldg., to manufacture metal beams and structural iron.

YOUNGSTOWN — Micro-Cast Mfg. Co. has been incorporated by J. Thomas Stubbins, 65 Wayne Ave., with 3000 shares no par value, to manufacture castings and stampings.

OREGON

KLAMATH FALLS, OREG.—Bids will be received Aug. 26 by the Bureau of Reclamation, Denver, for construction of the Adams pumping plant, involving a large quantity of concrete pipe.

PORTLAND, OREG.—State Highway Commission will open bids here Aug. 6 and 7 for road and bridge projects to cost a total of $1,500,000. R. H. Baldock is state highway engineer.

PORTLAND, OREG.—Pacific Wire & Fence Co. has let contract to Knott, Rogers & Dunbar for construction of a plant and addition to facilities at Sherman and SE Eleventh Sts. Barret & Logan are architects.

SPRINGFIELD, OREG.—Clear Fir Products Co., Springfield, has let contract for crane runway building and crane, to cost about $50,000.

PENNSYLVANIA

ERIE, PA.—Burke Electric Co., 1201 West Twelfth St., E. E. Crompton, president, will build an addition for manufacture of fractional horsepower motors, to cost about $16,000.

MEADVILLE, PA.—National Bearing Metals Corp. has started construction of a new plant costing over $2 million. Present plant will be continued as an auxiliary factory.

TEXAS

DALLAS, TEX.—Cullum & Borch Co., 1509 Elm St., is having plans prepared for a plant addition, three stories, to cost about $125,000.

DALLAS, TEX.—Holister Coil Spring Mfg. Co. of Texas, 2932 Commerce St., plans a plant for manufacture of metal products, to cost about $110,000. Block & Hundley, care owners, are architects.

HOUSTON, TEX.—Diamond Alkali Co., Oliver Bldg., Pittsburgh, has let contract to Brown & Root Inc., 4300 Calhoun Rd., for design and construction of an electrochemical plant to cost over $5 million.

LAMESA, TEX.—Stanolind Oil & Gas Co., Fair Building, Ft. Worth, Tex., plans construction of a natural gasoline plant in Slaughter field, to cost about $2,500,000.

ORANGE, TEX.—E. I. du Pont de Nemours & Co., Wilmington, Del., plans plants for manufacture of methanol and polythene, two plants, estimated to cost $30 million each.

WACO, TEX. — Brazos River Transmission Electric Co-operative is having plans prepared for two 10,000-kw generating units, each costing over $2 million.

WASHINGTON

SEATTLE—Machinists Inc., 2224 South Fifth Ave. S., has bought an army structure 20 x 100 feet and will establish a machine shop, at 751 Michigan Ave.

SEATTLE—Bids will be called soon for a proposed $2 million Seattle-Tacoma airport, including reinforced administration building, garage, treatment plant and other facilities.

TACOMA, WASH.—J. C. Boespflug Construction Co., Seattle, has been given contract at $1,162,259 for installation of services at the navy inactive station at Tacoma.

VANCOUVER, WASH.—City has bought 17-acre site on which to build a sewage treatment plant to cost about $80,000.

WISCONSIN

MANITOWOS, WIS.—Aluminum Goods Mfg. Co., 1502 Washington St., has let contract to Hamann Construction Co., Reed and North Eighth streets, for a one-story 102 x 145-foot rolling mill addition.

WATERTOWN, WIS. — Inland Grey Iron Foundry Inc., J. H. Budda Jr., 9116 Jackson Park Blvd., Wauwatosa, Wis., plans a one-story 65 x 150-foot foundry plant. A. Kuenzi, 202 North Water St., is engineer.

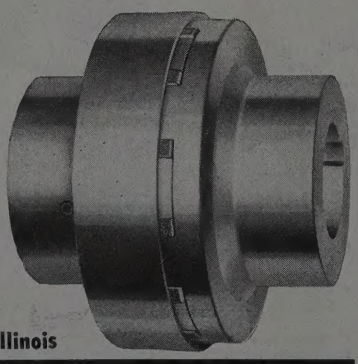
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